Appendix A
HARP How-To Guides

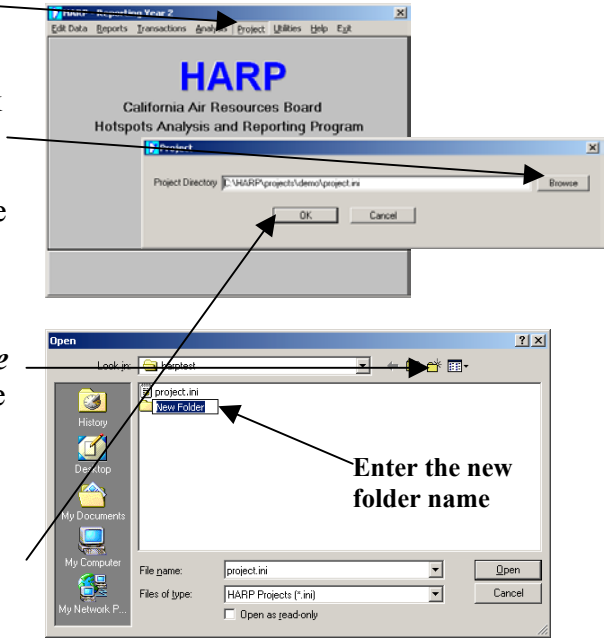
The HARP How-To Guides are supplemental instruction aids to the user guide. They provide steps-by-step procedures to carry out some of the basic functions of HARP. The guides were written in a manner that assumes the reader has a basic understanding of HARP. For detailed information about HARP, please see the user guide.

Topic 1: How to Start a Project

Step 1. Creating a Project Folder

The first thing you need to do is to tell HARP where to save all of the files it creates.

1. From the HARP main menu, select ***Project***.
2. A popup window will show the current project directory. To select a new project directory, click on ***Browse***.
3. To change the project directory, use the Open File dialogue box to browse and switch to a different directory. Then click on ***Open***.
4. To create a new project directory, click the ***Create New Folder*** icon. Enter the new folder name (see Note 1). Then click on the right mouse button and choose ***Refresh***. Double-click on your new folder to open it. Then click on ***Open***.
5. Click on ***OK*** on the project window to change the project directory.



Note 1: There can be no spaces in the file name or path that you create.

Step 2. Opening a Database

Next, you will need to open the facility and emissions database file.

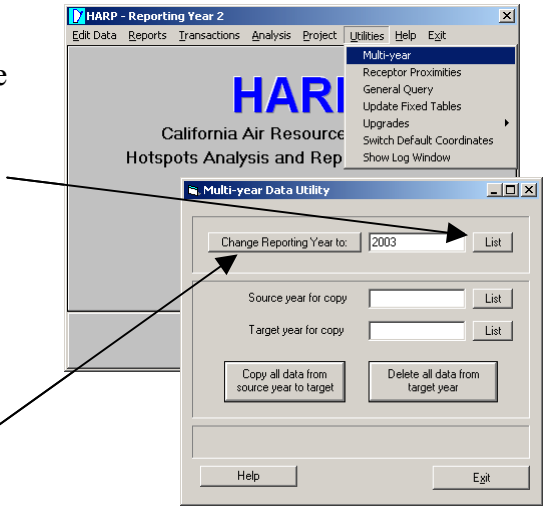
1. From the HARP main menu, select ***Edit Data/Open Database***.
2. In the dialog window, browse and select the default database *HARP.mdb* (C:\HARP\HARP.mdb). Then click on ***Open***.

Note 2: You cannot create a new database from scratch. If you wish to create a new database, you must highlight the default HARP database file, then click on the right mouse button and select *Copy*. Click on the right mouse button again and choose *Paste*. Once the file has been copied, you must rename the file. Highlight the new file and then click on the right mouse button and choose *Rename*. The file name should contain no spaces.

Step 3. Selecting a Reporting Year

Next, select the year that you would like the emissions information to be stored in. If you are creating an emissions database for CEIDARS reporting purposes, the year should match the year of the data.

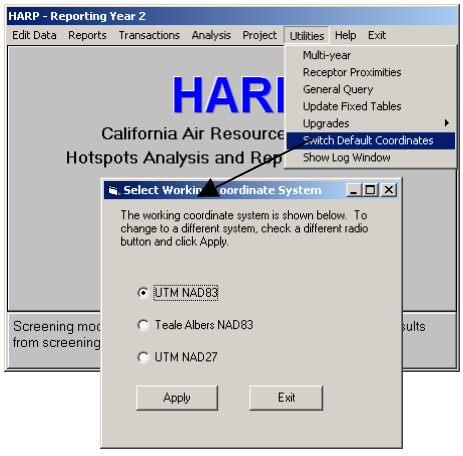
1. From main menu, select ***Utilities/Multi-year***.
2. The current reporting year will be displayed in the top field. To change the reporting year, press the ***List*** button. Double-click on the year you want the information to be stored in.
3. If the year you want is not available from the list, press ***Cancel*** and return to the previous screen. Enter the new reporting year in the top field.
4. Then click the button labeled ***Change Reporting Year To***. REMEMBER: HARP will not change the reporting year until you press this button. Then click on ***Open***.
5. You also have the option of copying data from an existing year to the newly created reporting year.



Step 4. Using a Common Coordinate System

HARP can convert all location coordinates into one common coordinate system. Use this feature to convert facilities in different location coordinates to a common coordinate system or to switch an entire analysis to a different projection system.

1. To convert all UTM location coordinates into the same coordinate system select ***Utilities/Switch Default Coordinates***. The default is NAD83. Click on the radio button next to the desired coordinate system. Click ***Apply*** and then ***Exit***



Topic 2: How to Add Data to the Facility and Emission Inventory Database

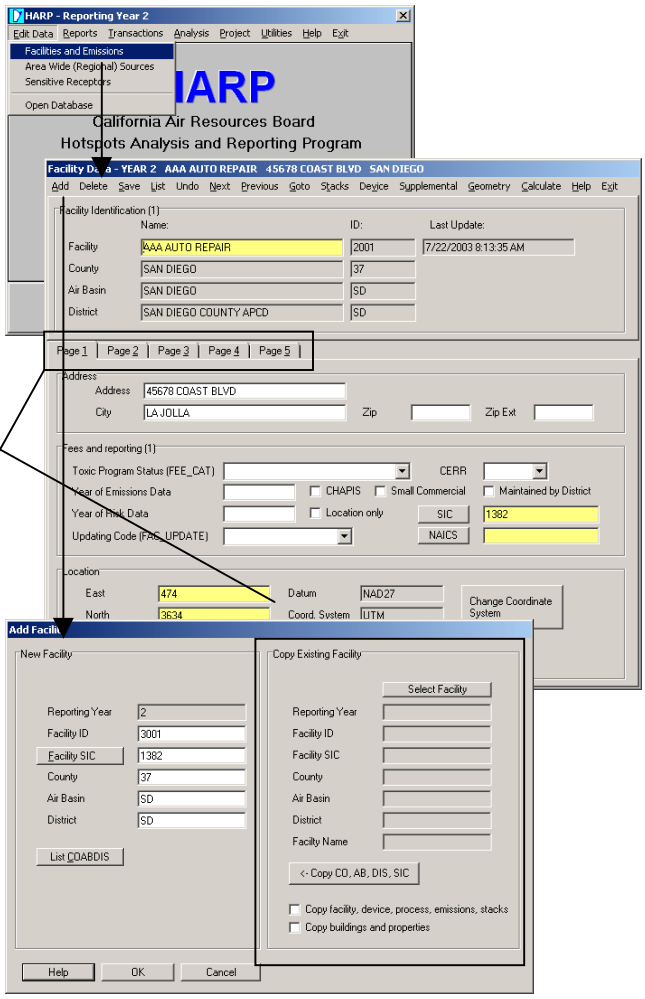
HARP's facility and emission inventory database, also known as CEIDARS-Lite (California Emission Inventory Development and Reporting System-Lite), can be used by facility operators and local air district staff to organize and manage their criteria and toxics emissions data. The database can also be exported to submit emissions data directly to either the local air district or to the ARB. For more information on setting up an emission inventory database, see Chapters 4 and 5 in the HARP User Guide.

Prerequisite

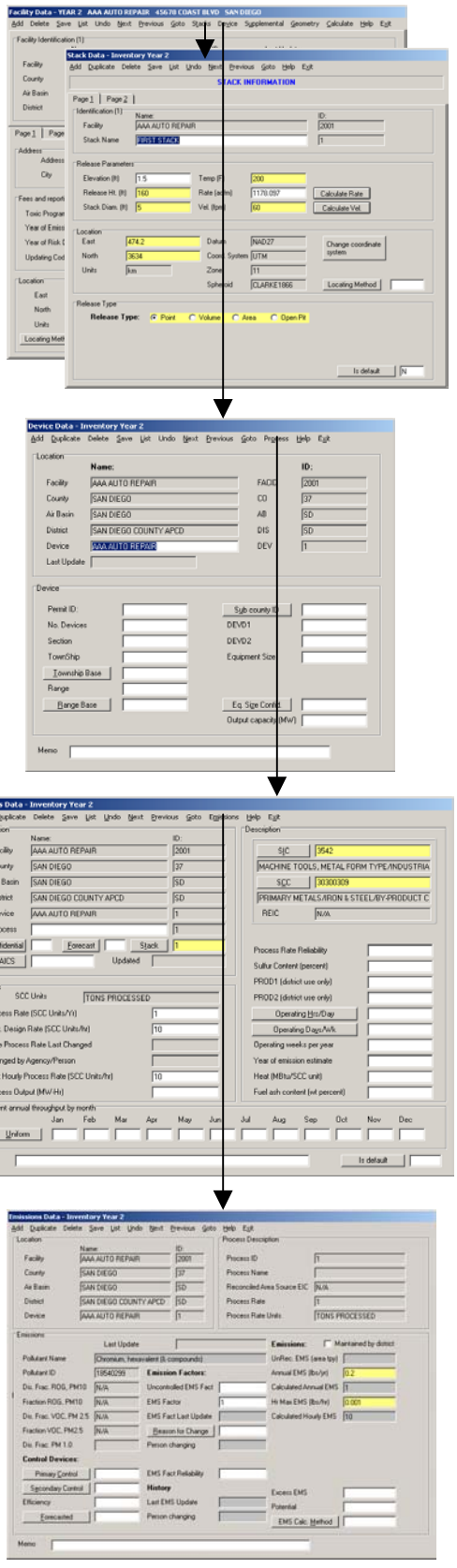
Before you can add your data to the emissions inventory database, you must first open a project in HARP (See Topic 1 in the How-To Guide for instructions).

Step 1. Adding Facility and Emission Data

1. To begin adding your facility data, select ***Edit Data/Facilities and Emissions*** from the HARP main menu to enter the ***Facility Data*** window.
2. To add a new facility, click on ***Add*** from the top menu. Fill in all blank fields in the ***Add Facility*** window. Use the buttons in this section to help fill in the information. If the new facility is similar to an existing facility, you can copy all or part of an existing facility into the new record using the ***Copy Existing Facility*** section. Click ***OK***.
3. Fill in all blank fields in the ***Facility Data*** window for pages 1-5. The yellow fields are required if you plan to conduct a health risk analysis. For instructions on how to enter the receptor proximity on Page 3 of the ***Facility Data*** window, see Topic 4 of the HARP How-To Guide. Click ***Save*** from the top menu.



4. To add stack information click on ***Stacks*** from the ***Facility Data*** window. Click on ***Add*** from the new window. Fill in all blank fields for the stack. The yellow cells are required if you plan to conduct a health risk analysis. If you want to copy an existing stack, click ***List*** and double click on a stack of interest from the popup window. HARP will display the data for this stack. Then click on ***Duplicate*** and enter a new unique stack identification number. Click ***Save*** and ***Exit*** when finished.
5. To add the device information, click on ***Device*** from the ***Facility Data*** window. Click on ***Add*** from the new window. Fill in all blank fields for the device. The yellow cells are required if you plan to conduct a health risk analysis. If you want to copy an existing device, click ***List*** and pick a device of interest from the popup list window. Then click on ***Duplicate*** and enter a new unique device identification number. Click ***Save*** when finished.
6. To add the process information, click on ***Process*** from the ***Device Data*** window. Click on ***Add*** from the new window. Fill in all blank fields for the process information. If you want to copy existing process information, click ***List*** and double click on a process of interest from the popup window. Then click on ***Duplicate*** and enter a new unique process identification number. Click ***Save*** when finished.
7. To add the emissions information, click ***Emissions*** from the ***Process Data*** window. To add a new pollutant, click on ***Add.*** If you want to copy existing pollutant information, click ***List*** and double click on a pollutant of interest from the popup window. Then click on ***Duplicate*** and enter a new pollutant identification number. Click ***Save*** when finished.



8. Exit out of the ***Emission***, ***Process***, and ***Device*** windows to return to main ***Facility Data*** window

Step 2. Defining Building Geometry

Next, you will need to enter the data for the building and property geometry. This information will be used to calculate building downwash in the dispersion analysis to generate property boundary receptors (See the HARP User Guide for more information).

1. From the main ***Facility Data*** window, click ***Geometry/Buildings.***
2. To add a new building, click on ***Add***. Enter ID number, number of corners, and Tier number. Click ***OK***.
3. Enter the building description, height, and elevation. Click on ***Save***.
4. Select ***Edit Points***, to enter/edit the vertex points for the building. Enter the relative distance for each point (See the illustration below for help on inputting). Click on ***Exit*** to return to the main Building Geometry window.
5. Repeat the above steps to add more buildings or tiers. (Window Legend: The currently selected building tier is shown in red. Stacks are shown as small red circles (solid line). The diameter of the circle is the diameter of the stack. The large dotted circle around each stack is merely a visual aid to make it easier to locate the stacks on the map when the map scale is small. The diameter of the dotted circles has no significance.)

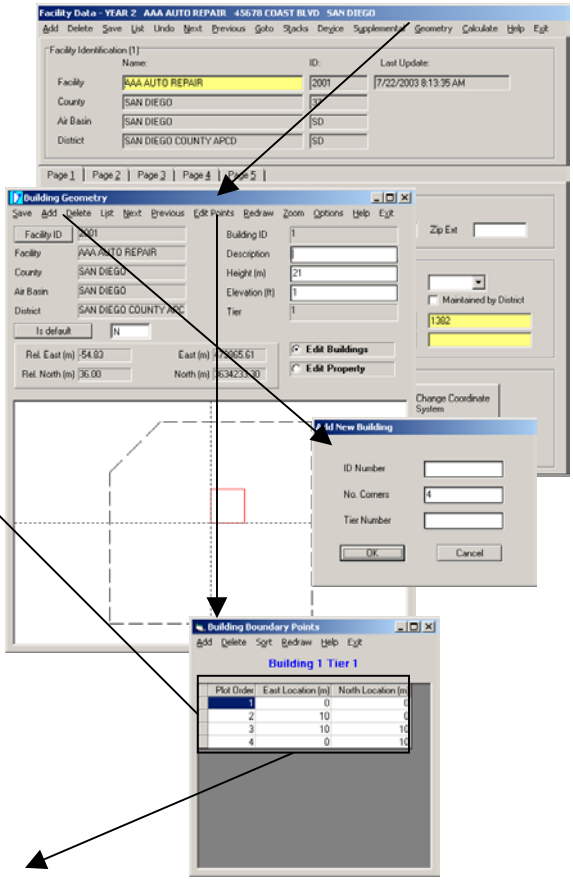
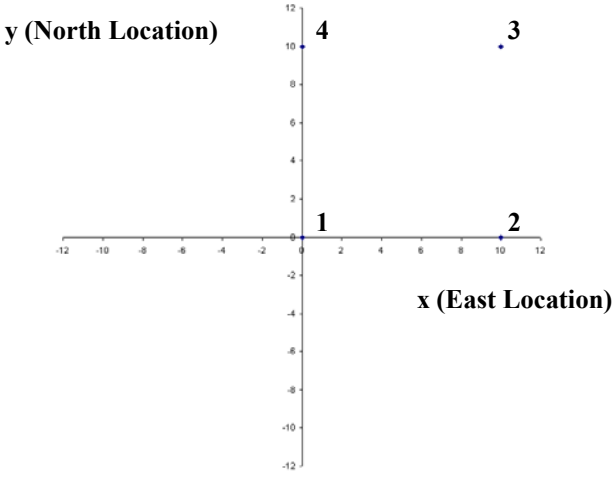


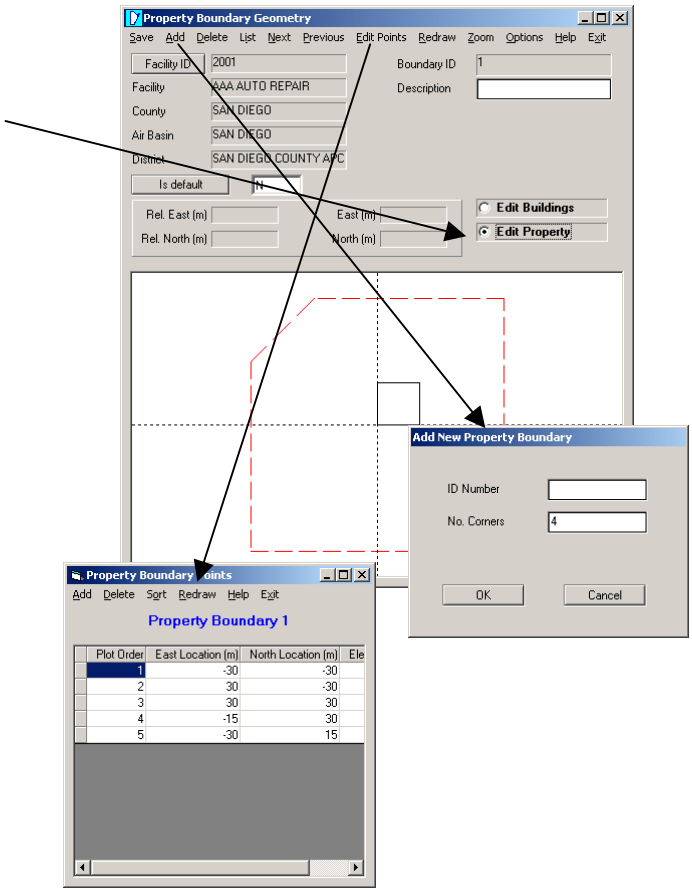
Illustration of Building Boundary Points



Step 3. Defining Property Geometry

Next, you will need to enter the property boundary data. Property boundary data is used to locate boundary receptors along the property boundary for risk analysis. Once the property boundaries have been identified, HARP can generate receptors at regular intervals along the boundary automatically so that you do not have to figure out the UTM coordinates of each boundary receptor. Each facility may have one or more property boundaries. The boundary curves do not have to be connected. (See the HARP User Guide for more information.)

1. To add information on the property boundary, click ***Geometry/Property boundaries*** from the main ***Facility Data window*** or click on the ***Edit Property*** radio button on the ***Property Boundary Geometry*** window
2. To add a new property boundary, click on ***Add*** from the top menu. Enter ID number and number of corners. Click ***OK***
3. Enter building description. Click on ***Save***.
4. Select ***Edit Points***, to enter/edit the vertex points for the property boundary. Enter the relative distance for each point. Click on ***Exit*** to return to the ***Property Boundary Geometry*** window.
5. Repeat the above steps to add more property boundaries to the database. When all of your facilities are entered, return to the HARP main menu. From the HARP Main window you can create reports from the database, export the database to a third party, or set-up and air dispersion run on data within the database.



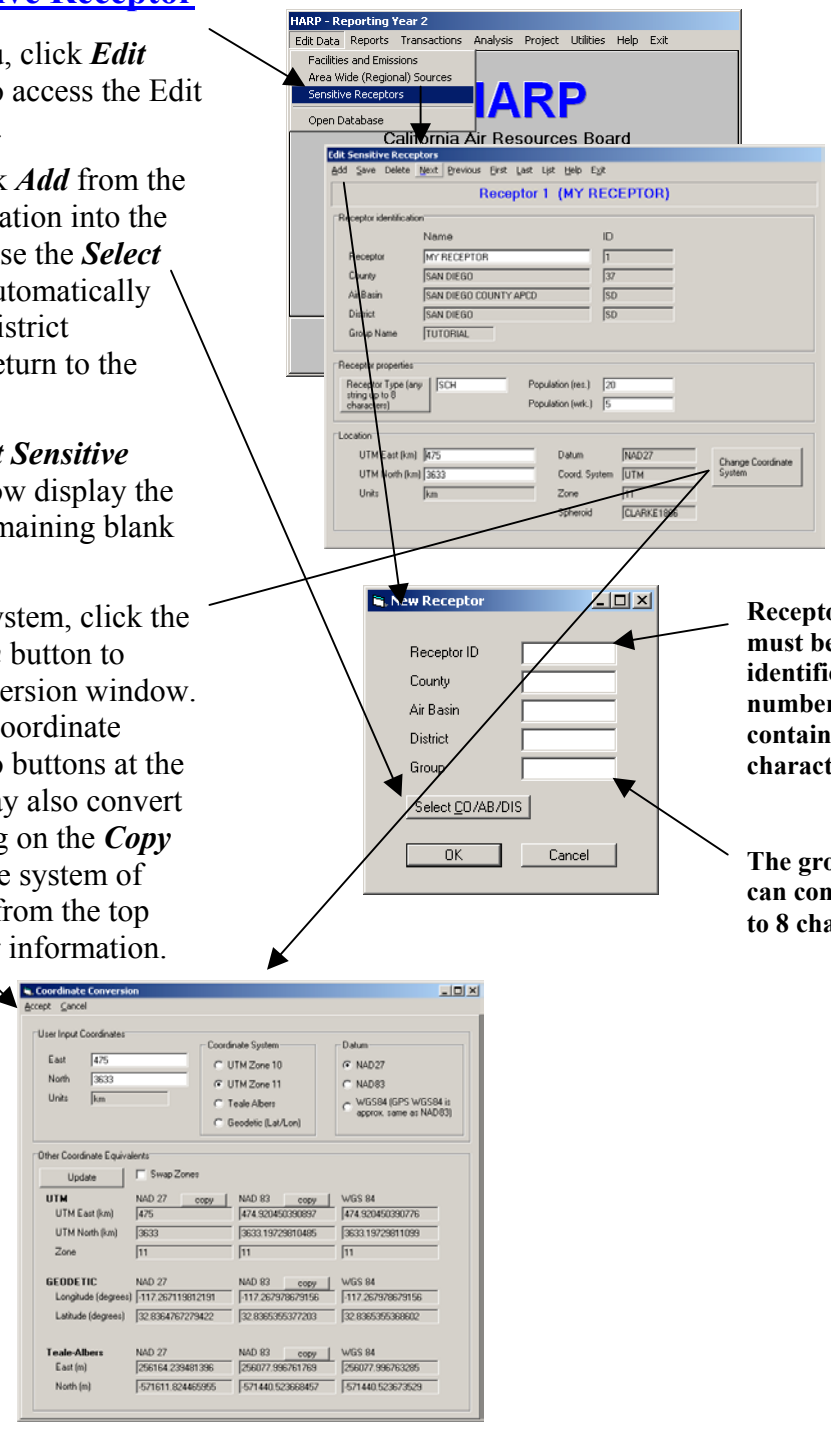
Topic 3: How to Create/Edit/Export/Import Sensitive Receptors

Prerequisite

Before you can create, edit, import, or export sensitive receptors, you must open a project (See Topic 1 in the HARP How-To Guides for instructions). For more information on sensitive receptors, see Chapters 5 and 4 in the HARP User Guide.

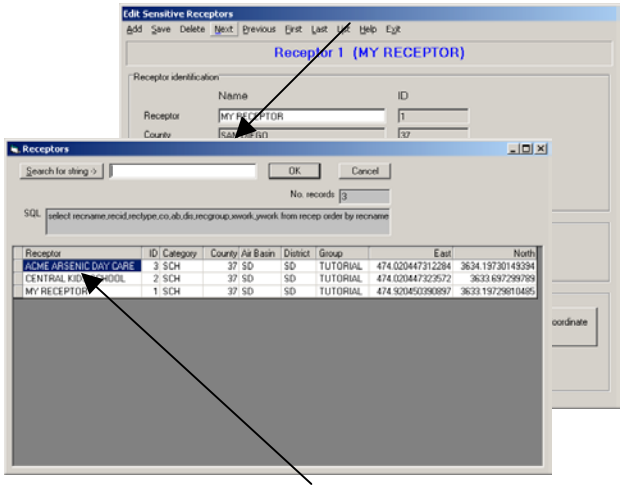
Step 1. Creating a Sensitive Receptor

1. From the HARP main menu, click ***Edit Data/Sensitive Receptors*** to access the Edit Sensitive Receptor window.
2. To add a new receptor, click ***Add*** from the top menu. Enter the information into the popup window. You may use the ***Select CO/AB/District*** button to automatically add county, air basin, and district information. Click ***OK*** to return to the previous window.
3. When you return to the ***Edit Sensitive Receptor*** window, it will now display the new receptor. Fill in the remaining blank fields.
4. To change the coordinate system, click the ***Change Coordinate System*** button to access the Coordinate Conversion window. Here, you may change the coordinate system by clicking the radio buttons at the top of the window. You may also convert your coordinates by clicking on the ***Copy*** button next to the coordinate system of your choice. Click ***Accept*** from the top menu to update the receptor information.

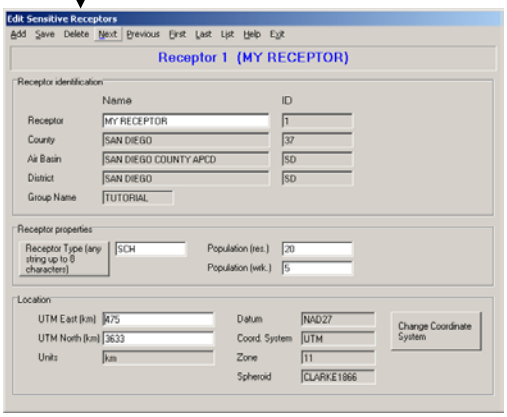


Step 2. Edit a Receptor

1. To edit a sensitive receptor, access the ***Edit Sensitive Receptors*** window.
2. Click ***List*** at the top of menu. A window will popup displaying all sensitive receptors in your database.
3. Browse and double click on the sensitive receptor that you wish to edit. By doubling-clicking, it will return you to the ***Edit Sensitive Receptor*** window with the selected receptor information displayed. You may edit all information highlighted in white.
4. To delete a receptor, select a receptor using the ***List*** function. Press ***Delete*** at the top menu to delete the receptor.



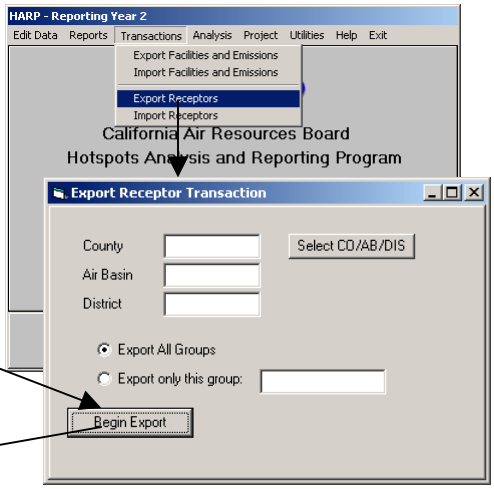
Double click on a receptor to edit

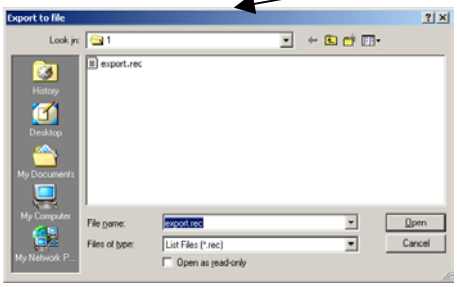


Step 3. Exporting Receptors

The transaction module of HARP allows receptor information to be shared with other HARP users. The module generates a transaction file, which can be easily imported into HARP on another computer.

1. From the HARP main menu, click ***Transaction/Export Receptors***.
2. Type in the county, air basin, district, or specific group of receptors you wish to export. Alternatively, you may click the ***Select CO/AB/DIS*** button to select a specific county, air basin, and district.
3. Click the ***Begin Export*** button to export the receptors. Unless otherwise specified, HARP will by default save the file as "export.rec" to your project directory. Click ***Open*** to create the file.

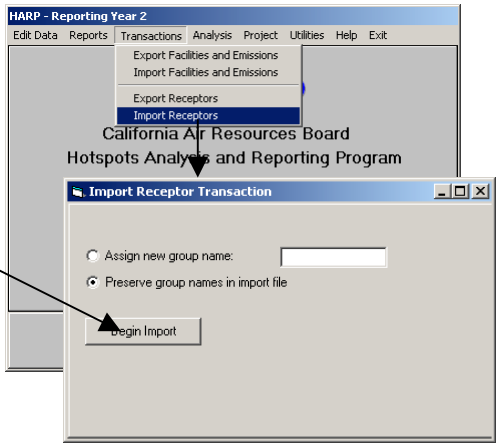




Step 4. Importing Receptors

HARP requires a specific file format for importing receptors.

1. First, make sure that your transaction file is copied to your project directory in HARP.
2. From the HARP main menu, click ***Transaction/Import Receptors***.
3. Click the ***Begin Import*** button. Browse and double click on the receptor file. A popup window will appear informing you that HARP has finished importing the receptors.



Topic 4: How to Perform a Prioritization Analysis

HARP performs the prioritization calculations in accordance with the guidelines set forth by the California Air Pollution Control Officers Association in the document entitled *CAPCOA Air Toxics "Hot Spots" Program Facility Prioritization Guidelines (July 1990)*. In addition, the HARP software automatically applies the appropriate molecular weight adjustment factor (MWAF) for each Hot Spots substance; therefore, facility emissions should not be manually adjusted before entering them into HARP (see Appendix I for a list of MWAFs, Chapter 4 of the OEHHA Guidance Manual for an example calculation, or the Emission Inventory Criteria Guidelines for reporting guidance). For more information on setting up a prioritization analysis, see Chapter 8 in the HARP User Guide.

Prioritization scores are used to determine which facilities shall complete a health risk assessment for the "Hot Spots" Program. Prioritization scores should not to be interpreted as estimates of potential health impacts. Only a health risk assessment can provide those types of estimates. This functionality is intended for District use.

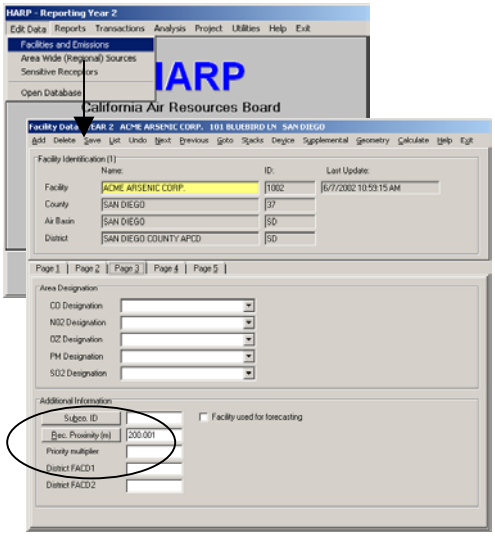
Prerequisite

Before you can run a prioritization analysis, you must first add your facility and emissions data into the CEIDARS-Lite emissions inventory database within HARP (See Topic 2 in the HARP How-To Guides for instructions).

Step 1. Calculating Receptor Proximities

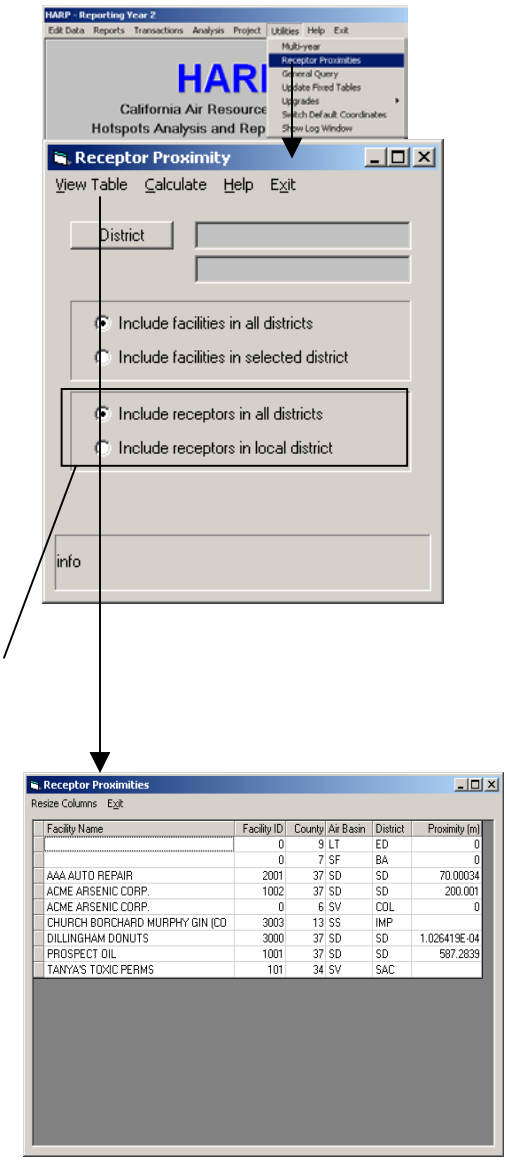
Receptor proximities are required to perform a prioritization analysis. If you have not done so already, you must enter the ***Rec. Proximity (m)*** field on Page 3 of the ***Facility Data*** window. You must do this for each facility you wish to include in the prioritization analysis. If applicable, also enter a value in the ***Priority Multiplier*** field. This factor is used to adjust a facility score. For example, this could be used if a facility emits multipathway pollutants (see the HARP User Manual and the CAPCOA prioritization guidelines for more information).

1. To begin, select ***Edit Data/Facilities and Emissions*** from the HARP main menu to enter the ***Facility Data*** window.
2. Choose a facility of interest by selecting ***List*** from the top menu. Then double click on the facility from the popup window. The ***Facility Data*** window will now display the selected facility.
3. Click the ***Page 3*** tab on ***Facility Data*** window and enter in the ***Receptor Proximity***. Note that if no value is entered for the receptor proximity, then HARP assumes that the distance is zero meters and no adjustment is made for the receptor proximity. If applicable, also enter a value in the ***Priority Multiplier*** field and select ***Save***. The priority multiplier could be



used, for example, if a facility emits multipathway pollutants or has receptors within 50 meters.

4. If you do not know the receptor proximity, it can be automatically calculated for you provided that you have set the facility boundary and entered the sensitive receptors. Press the ***Receptor Proximity*** button to automatically calculate the receptor proximity. For instruction on setting the facility boundary, see Topic 2 in the HARP How-To Guides. For instructions on inputting sensitive receptors, see Topic 3 in the HARP How-To Guides.
5. Alternatively, if you need to automatically calculate receptor proximities for several facilities in the manner as described above, select ***Utilities/Receptor Proximities*** from the HARP main menu to access the ***Receptor Proximity*** window.
6. If you want to calculate receptor proximities for select a specific district, click the ***District*** button from the ***Receptor Proximity*** window. Then double click on the district from the popup window. Click on the ***Include facilities in selected district*** radio button. Then click on the ***Include receptors in local district*** radio button.
7. If you want to calculate receptor proximities regardless of the district, click the ***Include facilities in all districts*** radio button. Then click on the ***Include receptors in all districts*** radio button.
8. Next, click ***Calculate*** from the top menu.
9. To view or edit the calculated receptor proximities, click ***View Table*** from the ***Receptor Proximity*** window. Click ***Exit*** from the top menu when finished.



Step 2. Running the Prioritization Analysis

1a. To access the prioritization analysis window, click ***Calculate/Priority*** from the ***Facility Data*** window.

or

1b. From the HARP main menu, click ***Reports/Prioritization***.

2. In the ***Prioritization Report*** window, select one of the two radio buttons at the top. To calculate priorities for all facilities in a district, select the first top radio button. To calculate priorities for a single facility, select second radio button.

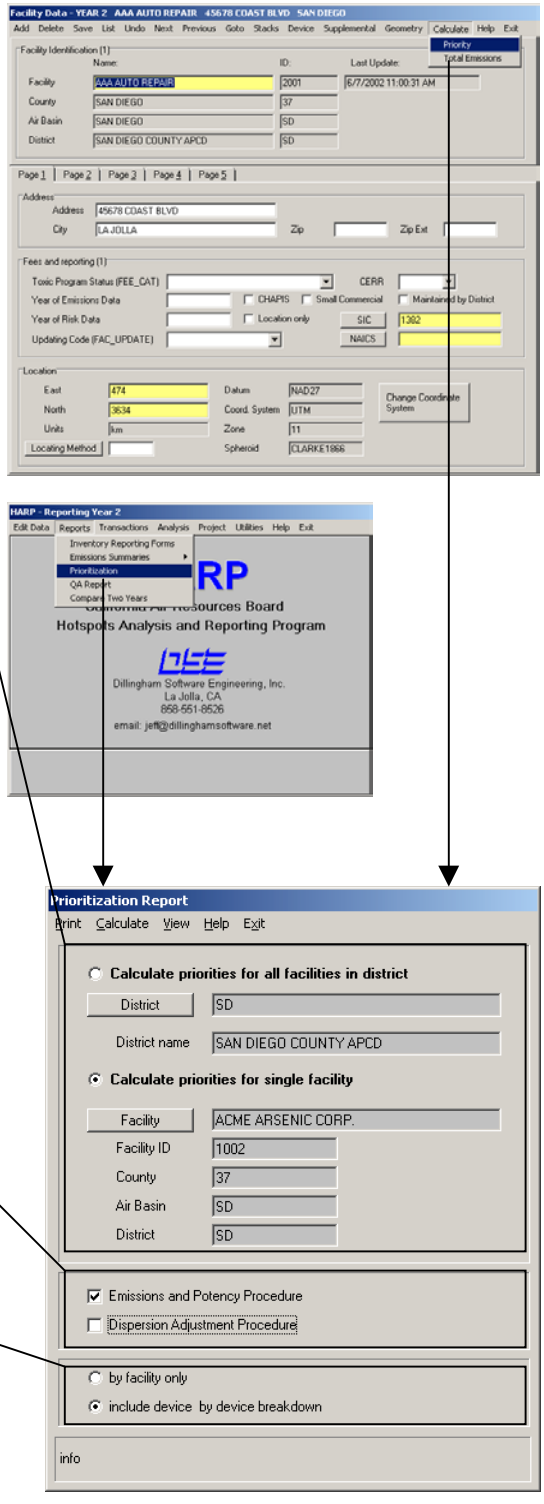
3. If you chose to calculate priorities for all facilities in a district, click the District button. To select a district, double click on a district from the popup window. You will then be returned to the Prioritization Report window with the selected district.

4. If you chose to calculate priorities for a single facility, click the Facility button. To select a facility, double click on a facility from the popup window. You will then be returned to the Prioritization Report window with the selected facility.

5. Next, use the check boxes to select which of the two calculation methods to use, either the Emissions and Potency Procedure or the Dispersion Adjustment Procedure, or both. If both methods are used, the total facility score will be the larger of the scores calculated by the two methods.

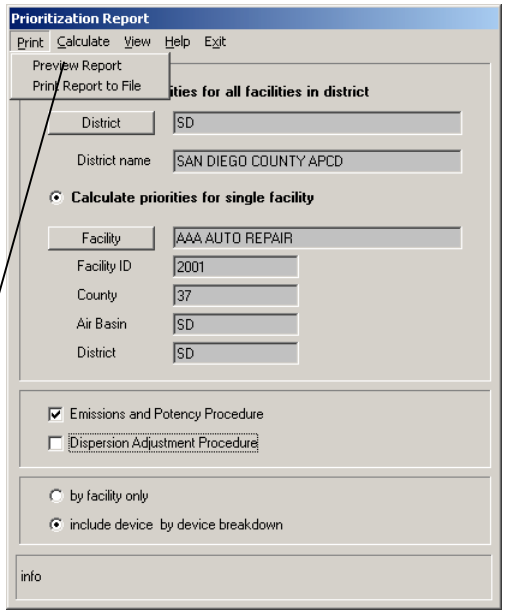
6. Next, use the bottom radio buttons to select whether you want the prioritization report to include by facility only or include a device by device breakdown.

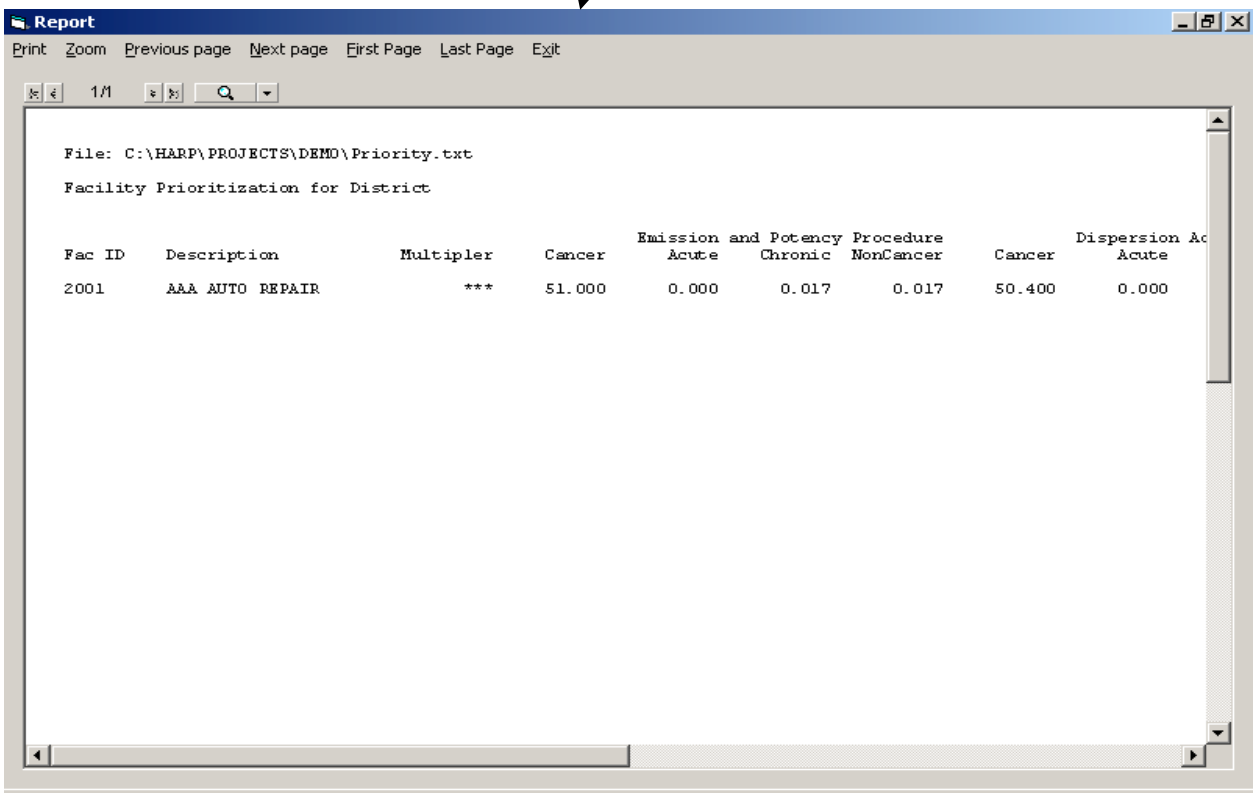
7. Select ***Calculate/Update Priority Database*** from the top menu to run the prioritization analysis.



Step 3. Displaying/Printing the Results

1. From the top menu of the ***Prioritization Report*** window, click ***Print/Preview*** to display the prioritization report. Select ***Print*** from the top of the ***Report*** window to print the report.
2. To save the report to a file, click ***Print/Print Report to File*** from the top menu of the ***Prioritization Report*** window.





Topic 5: How to Run an Air Dispersion Analysis

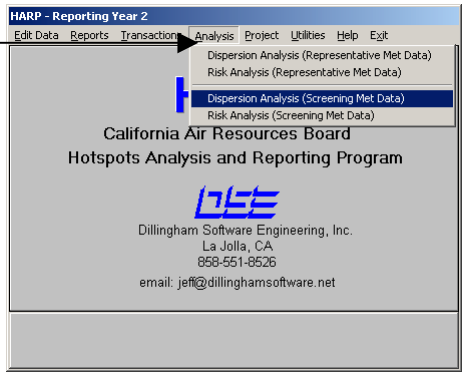
For the purpose of health risk assessments, the dispersion analysis module allows a user to build and run an input file for the U.S. EPA air dispersion model ISCST3 (Industrial Source Complex – Short Term 3). In HARP, ISCST3 is run in combination with the U.S. EPA building downwash model BPIP (Building Profile Input Program). For more information on setting up a dispersion analysis, see Chapters 4 and 9 in the HARP User Guide.

Prerequisite

Before you can run an air dispersion analysis, you must first add your emissions data into the CEIDARS-Lite emissions inventory database within HARP (See Topic 2 in the HARP How-To Guides for instructions). It is also necessary to set a default coordinate system (see Topic 1 in the HARP How-To Guides for information).

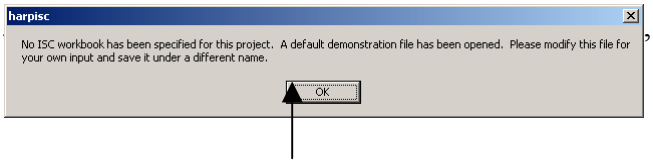
Step 1. Opening the Dispersion Analysis Module

1. From the HARP main menu, select ***Analysis***.
   - If you have actual meteorological data that is representative of the location you are analyzing, use the dispersion module for representative met data; select ***Dispersion Analysis (Representative Met Data)***.
   - If you are using screening meteorology data, select ***Dispersion Analysis (Screening Met Data)***.

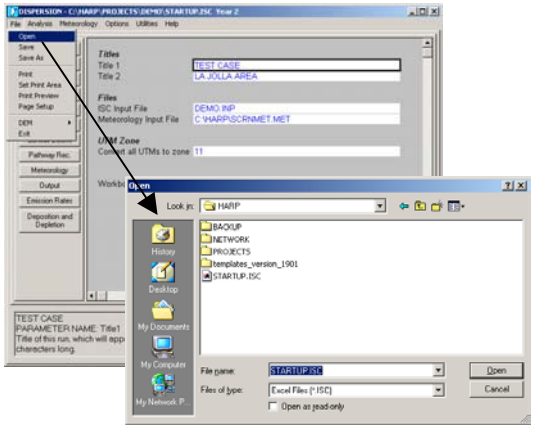


Step 2. Opening a Dispersion Analysis Workbook

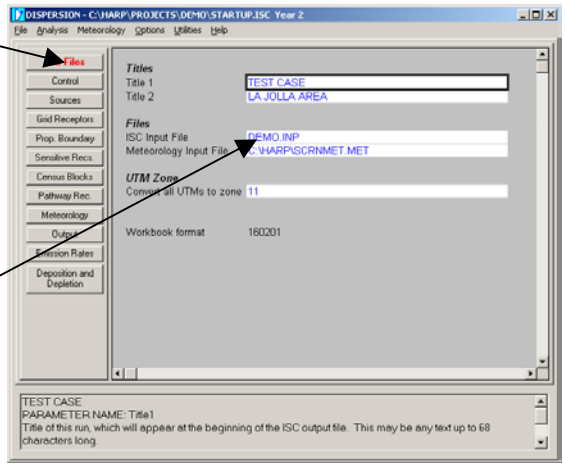
HARP will automatically open the last dispersion workbook used with your project directory. However, if there are no workbooks associated with your project directory, HARP will open a default workbook (STARTUP.ISC) in your project directory.

1. 

HARP will create a default workbook called "STARTUP.ISC" if there are no workbooks associated with your project directory



2. Click on the ***ISC Files*** button on the left side of the Dispersion screen. Fill in the information for Titles, Files, and UTM Zone (See Note 1). Then click ***File/Save As*** and save the file with a new name.



Note 1: All of the ISC input and output files created by HARP will have the same name as listed in the ISC Input File field. F2 will allow you to edit a cell without typing over the existing data.

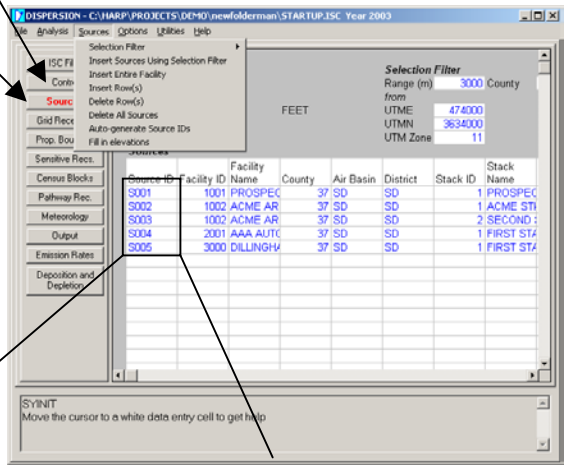
Step 3. Setting Control Parameters

1. To set the control parameters of how the analysis will be performed, click the ***Control*** button on the left side of the ***Dispersion*** screen. If you plan to use the regulatory defaults, then make no changes from the default settings.

Note 2: If your workbook was created from an existing workbook, it may contain existing facility data. You may need to clear this data before entering in the data for your analysis.

Step 4. Defining Emission Sources

1. Next you will need to define the emission sources and stack parameters. Click ***Sources*** button on the left side of the ***Dispersion*** screen.
2. Clear the preset data in this section of the workbook by selecting ***Sources/Delete All Sources*** from the top menu (See Note 2).
3. You may begin typing your data in manually or import it by clicking ***Sources/Insert Entire Facility*** from the top menu and pick a facility from the popup list (See Note 3).
4. HARP can automatically generate the ***Source ID*** column for you. Using your mouse, highlight all cells that need identification tags. Click ***Sources/Auto-generate Source IDs*** from the top menu to generate source identification tags.
5. Click ***File/Save*** to save the file.



To highlight the cells, click and hold the left mouse button and drag

Note 3: If you have already entered your facility data into the CEIDARS-Lite database, you may use the selection filter to import a group of facilities at one time from your database.

Step 5. Defining Receptor Grid

The Grid Receptors worksheet is used to describe the locations of receptors on a Cartesian grid using a facility as the origin. To begin, click the ***Grid Receptors*** button on the left side of the Dispersion screen. If you wish to exclude grid receptors in the dispersion analysis, type "NO" into the ***Include Grid*** field.

1. Click on ***Grid receptors/Set Origin to Facility*** from the top menu. Then select a facility to center the grid around.

2. Next, set the grid parameters. This will be the size of your grid and the distance between each grid point. In the fields under ***Grid Generation Parameters***, type in the minimum and maximum values for the north and east directions and the increments (See the illustration below for help with inputting).

3. Generate the grid by clicking ***Grid receptors/Generate Grid*** from the top menu. Finally, click ***File/Save*** from the top menu to save the file.

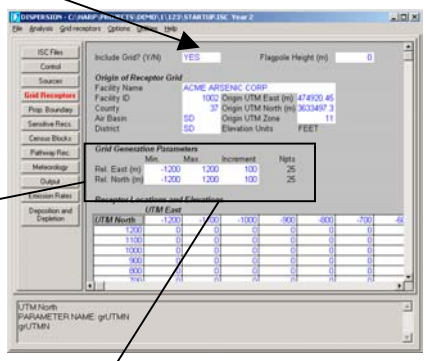
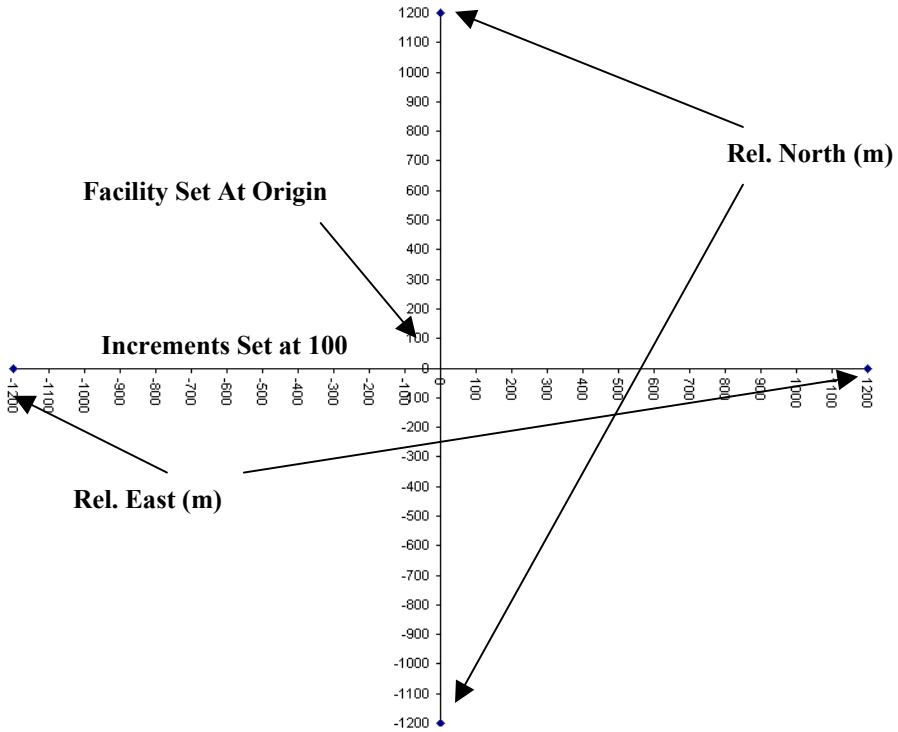
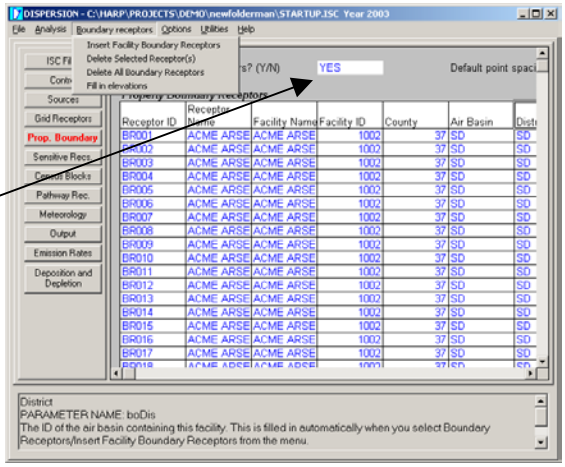


Illustration of the Grid Generation Parameter



Step 6. Defining Property Boundary Receptors



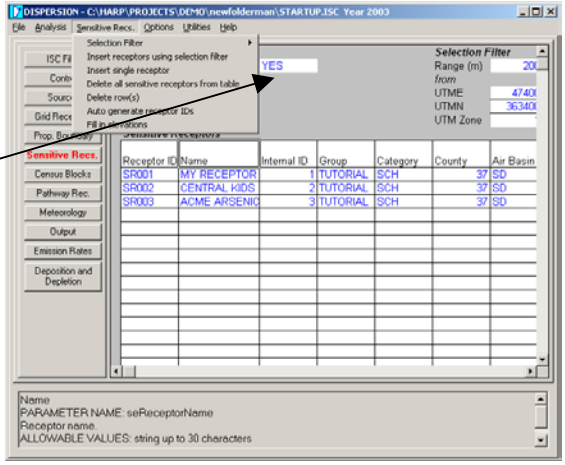
1. Property boundary receptors worksheet describes the locations of receptors on a facility property boundary. To define the receptors, start by clicking ***Prop. Boundary*** on the left side of the ***Dispersion*** screen. If you wish to exclude property boundary receptors in the dispersion analysis, type "NO" into the ***Include boundary receptors*** field.

2. Delete the boundary receptors from the previous workbook by clicking ***Boundary receptors/Delete All Boundary Receptors*** from the top menu (See Note 2).

3. Insert the property boundary receptors by clicking ***Boundary receptors/Insert Facility Boundary Receptors*** from the top menu. Then select a facility from the popup list.

4. Click ***File/Save*** from the top menu to save the file.

Step 7. Defining Sensitive Receptors

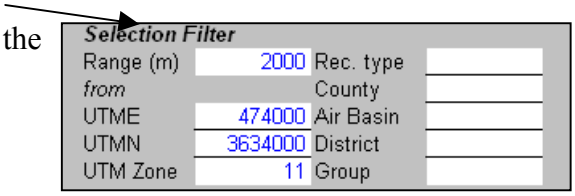


1. Sensitive receptors are specific points of interest (e.g., school). To add sensitive receptors, click ***Sensitive Recs.*** button on the left side of the ***Dispersion*** screen. If you wish to exclude sensitive receptors in the dispersion analysis, type "NO" into the ***Include Sensitive Receptors*** field.

2. Next, delete the existing receptor data from the workbook by clicking ***Sensitive Recs./Delete All Sensitive Receptors from table*** (See Note 2).

3. Insert the sensitive receptors that you would like to include in this analysis by using either the selection filter at the top of the window or picking the sources individually by clicking ***Sensitive Recs./Insert single receptor*** (See Note 3). This will add sensitive receptors that have been entered into the CEIDARS-Lite database. Sensitive receptor data can also be entered by hand directly into the sensitive receptor worksheet.

4. To use the selection filter, blank all the fields and type in the information you wish to use in your query for your receptors. Select ***Sensitive Recs./Insert receptors using selection filter*** from the top menu.

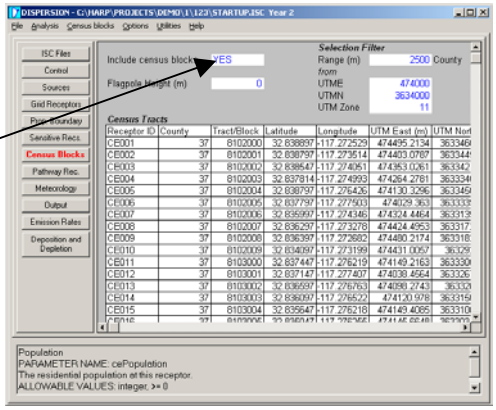


5. HARP can automatically generate the receptor identification tags for the ***Receptor ID*** column. Using your mouse, highlight all cells that need identification tags. To highlight the cells, click and hold the left mouse button and drag. Then click ***Sensitive Recs./Auto generate receptor IDs*** from the top menu to generate source identification tags.

6. Click ***File/Save*** from the top menu to save the file.

Step 8. Defining Census Block Receptors

1. Census block receptors will used to calculate population exposure and cancer burden. To add census receptors, click the ***Census Blocks*** button on the left side of the ***Dispersion*** screen. If you wish to exclude census block receptors in the dispersion analysis, type "NO" into the ***Include census block*** field.



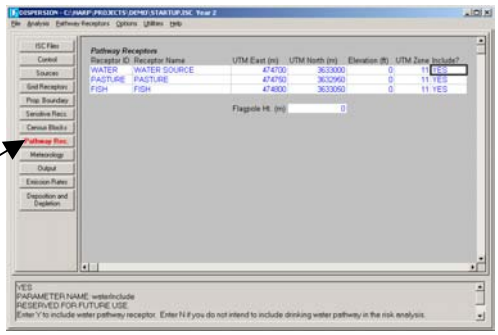
2. Delete the receptors from the previous workbook by clicking ***Census Blocks/Delete All Census Block Receptors*** from the top menu (See Note 2).

3. To select a set of census blocks around a facility, click ***Census Blocks/Selection Filter/Set section filter to origin to facility location*** from the top menu and select the facility. Enter a value into the range box. HARP will add all of the census block that are within this distance of the selected facility. Then click on ***Census Blocks/Insert Receptors Using Selection Filter*** from the top menu to import the census blocks.

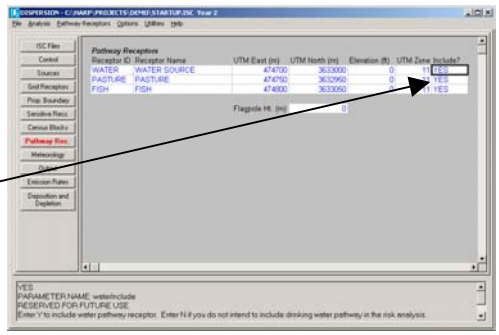
4. Click ***File/Save*** from the top menu to save the file.

Step 9. Defining Pathway Receptors

1. If you need to run a multipathway risk analysis, there are three pathway receptors that may be required. Click on the ***Pathway Rec.*** button on the left side of the ***Dispersion*** screen.



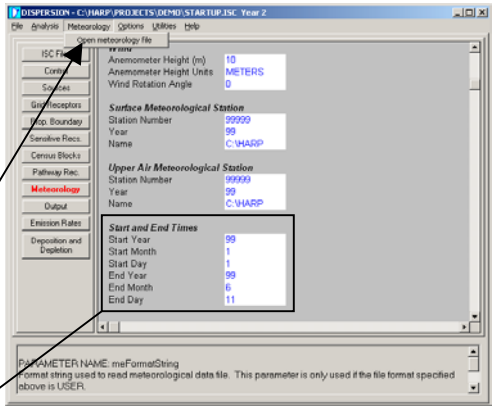
2. Enter the UTM coordinates and UTM zone for the water source, pasture land, and fishing water body.
3. Type "YES" into the last field of each pathway you wish to include in the multipathway risk analysis. Type "No" into the last field for pathways you do not intend to include in a multipathway risk analysis.



Step 10. Opening the Meteorology File (Only for Representative Data)

This step is only for the representative data version of the Dispersion Analysis module from Step 1. If you chose to use the screening meteorology version of the Dispersion Analysis module proceed to Step 11, the screening meteorology file has already been loaded for you.

1. Hourly meteorological data is needed to conduct a dispersion analysis. Click the ***Meteorology*** button on the left side of the ***Dispersion*** screen.
2. If you chose to use the representative meteorology version of the Dispersion Analysis module in the Step 1, you must now select the meteorology file. Click ***Meteorology/Open meteorology file***. Select a file.
3. Finally, confirm the meteorology parameters on the ***Dispersion*** screen corresponds to your file. Here is where you can also change start and end dates.

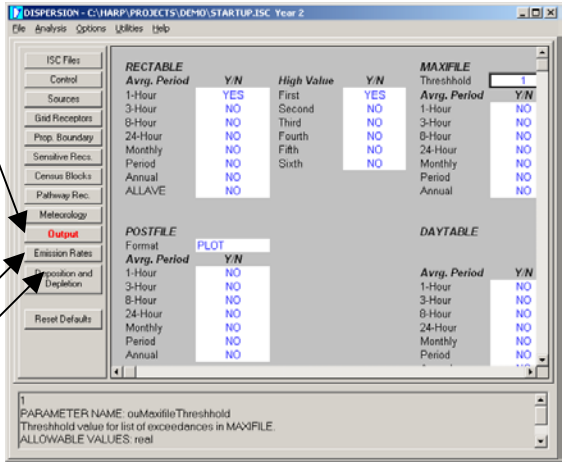


Step 11. Checking the Output Parameters

1. Click on the ***Output*** button on the left side of the Dispersion screen. The information in this window tells ISC how to create the output files. Most of the time you will keep the defaults.

Step 12. Options for Advance Users

1. The ***Emission Rates*** and ***Deposition and Depletion*** option is for advanced users. See the User Guide for more information.



Step 13. Adding Elevation Data

You can add data from DEM files to the entire Dispersion Analysis Workbook in two steps.

1. Open DEM files by selecting, ***Files/DEM/Open File.*** Browse and select the desired file.
2. Select ***Utilities/Look up all elevations*** from the menu.
3. After completing Step 1 through 13, select ***File/Save***.

Step 14. Building and Running ISCST3 Input

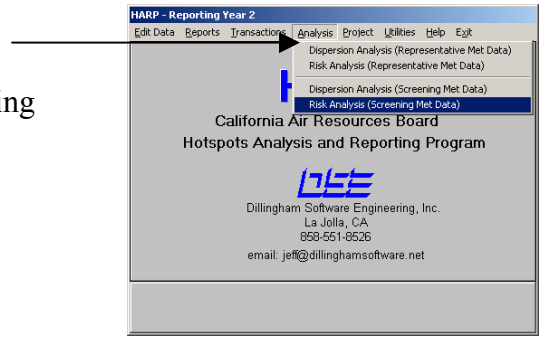
After you have completed each worksheet you are now ready to run ISCST3. Click on ***Analysis/Build ISC3 Input and Run***. Behind the scenes HARP will run ISCST3 and BPIP. All ISCST3 input and output files will be saved to your project directory. Exit the dispersion module and return to the HARP main menu. The dispersion analysis is complete.

Topic 6: How to Perform a Point Estimate Risk Analysis

Prerequisites

Before you can conduct a health risk analysis, you must first add your emissions data into the CEIDARS-Lite emissions inventory database within HARP and run an air dispersion analysis (See Topics 2 and 5 in the HARP How-To Guides for instructions). For more information on setting up a risk analysis, see Chapters 4 and 10 in the HARP User Guide.

Step 1. Opening the Risk Analysis Module

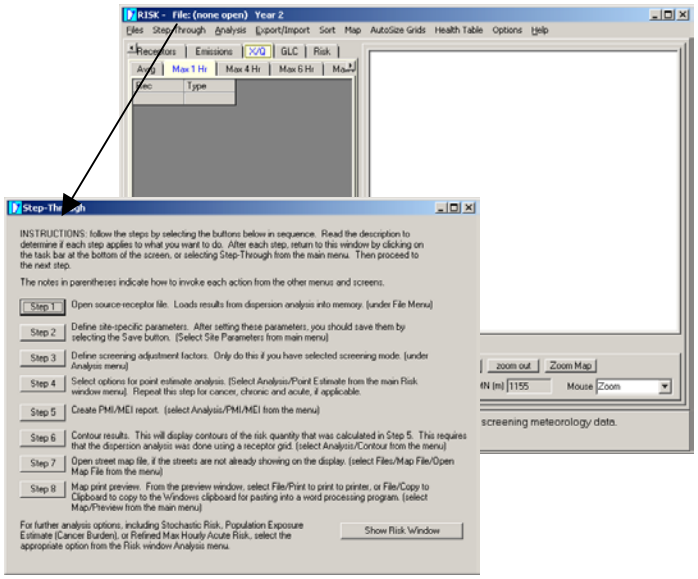


1. From the HARP main menu, select ***Analysis***.
   - If you have completed an air dispersion analysis using representative meteorology, select ***Risk Analysis (Representative Met Data)***.
   - If you have completed an air dispersion using screening meteorology data, select ***Risk Analysis (Screening Met Data)***.

Step 2. Opening the Step-Through Window

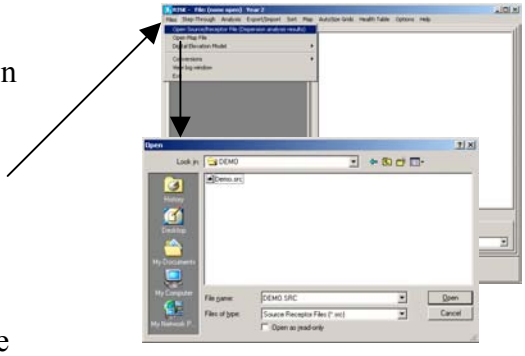
The Step-Through window guides users through the most common functions of the risk analysis process. A user can also perform these functions directly from the top menu of the main risk window.

1. To open the Step-Through window, click on the ***Step-Through*** menu item at the top of the main Risk window.



Step 3. Opening the Source/Receptor (SRC) File

The SRC file contains a list of sources and receptors used in the dispersion analysis and connects the dispersion results to the corresponding stack information in the CEIDARS-Lite database. It was created during the air dispersion analysis run and saved to your project directory (See Topic 5 in the HARP How-To Guides). The file name is the same as the ISC input, but with an "src" file extension.

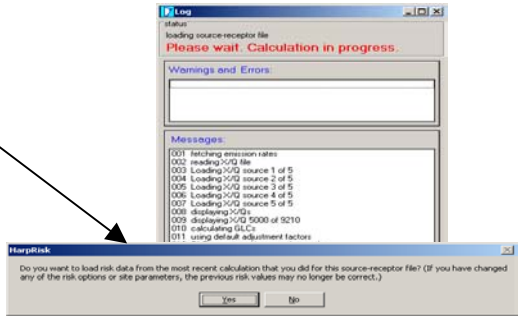


1a. On the ***Step-Through*** window, click ***Step 1***. Click on the SRC file. Click ***Open***.

or

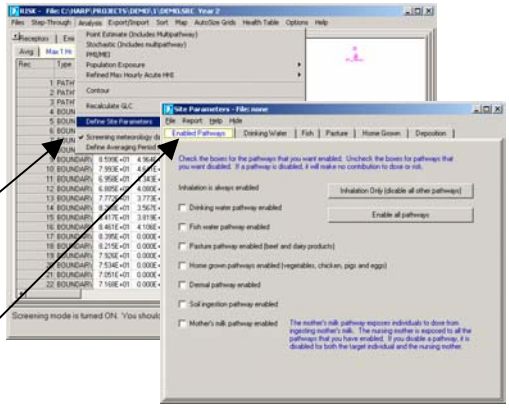
1b. From the main ***Risk*** window, select ***File/Open Source/Receptor File (Dispersion analysis results)***. Click on the SRC file. Click ***Open***.

2. If you have previously used this SRC file to calculate risk, HARP will ask if you want to load the most recent risk calculations associated with this SRC file. Click ***NO***, if you are going to do more calculations using this data. Click ***YES***, if the point estimate risk data calculations are complete and you are viewing, printing, or conducting a stochastic analysis.



3. HARP will automatically hide the X/Q and GLC values. To display these values, uncheck the menu item under ***Options/Display GLC and X/Q Details***. When this item is checked, the GLC and X/Q values will be displayed immediately.

Step 4. Defining Site-Specific Parameters



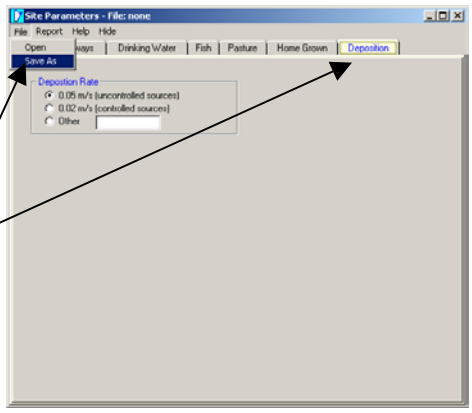
1a. On the ***Step-Through*** window, click ***Step 2***. This will open the ***Site Parameters*** window.

or

1b. From the main ***Risk*** window, select ***Analysis/Define Site Parameters***. This will open the ***Site Parameters*** window.

2. Click on the ***Enabled Pathways*** tab.

3. Place a check next to each pathway you wish to include in the point estimate risk analysis.
4. If you enable the drinking water, fish, pasture, and homegrown pathways you will need to add the required information in the corresponding tabs.
5. Choose a deposition rate under the ***Deposition*** tab.
6. Click ***File/Save As*** to save the file.
7. Click ***Hide*** to close the ***Site-Specific Parameters*** window.



Step 5. Defining Screening Adjustment Factor

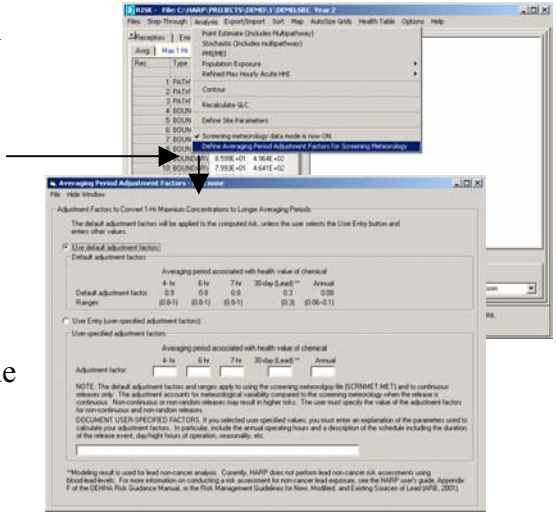
Averaging Period Adjustment Factors are only used with screening meteorology. Therefore, if you are using representative meteorology skip to Step 6.

1a. On the ***Step-Through*** window, click ***Step 3***. This will open the ***Site Parameters*** window.

or

1b. From the main ***Risk*** window, select ***Analysis/ Define Averaging Period Adjustment Factors for Screening Meteorology***. This will open the ***Averaging Period Adjustment Factors*** window.

2. Use the default adjustment factors or enter your own under user defined. (For information on how to use the averaging period adjustment factors, see Section 9.6.2 of the User Guide.)
3. Hide or close the ***Averaging Period Adjustment Factors*** window.

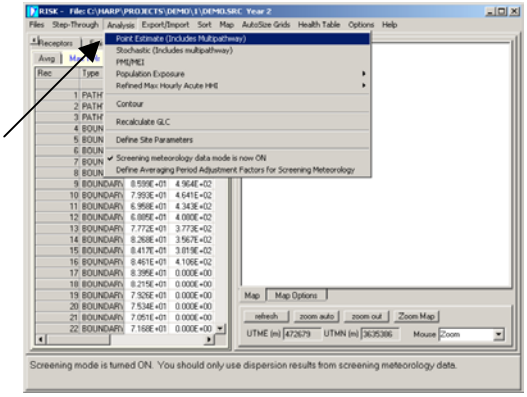


Step 6. Setting up Point Estimate Risk Analysis

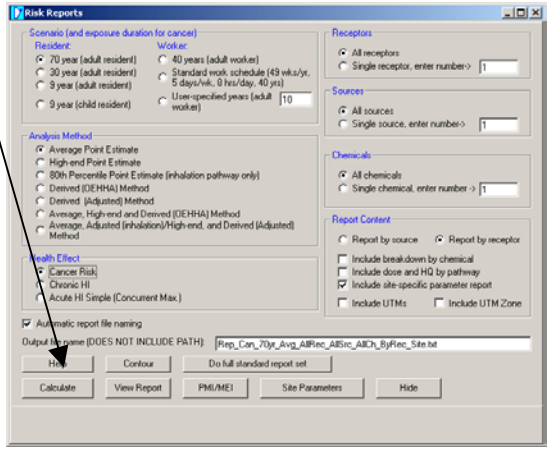
1a. On the ***Step-Through*** window, click ***Step 4***. This will open the ***Risk Reports*** window.

or

1b. From the main ***Risk*** window, select ***Analysis/Point Estimate (Includes Multipathway)***. This will open the ***Risk Reports*** window.



2. Click on the button next to each item that you would like to include in the risk analysis.
3. Click ***Calculate***. HARP will show you a preview of the report. Save the report to project directory. Close the report.
4. At this point, the risk values will be added to the data view window. Click on the risk tab on the right side of the main risk window. The cancer, chronic, and acute risk values will be displayed. If no value has been calculated a –1.00E+00 will be displayed for each receptor.
5. Repeat steps 2-3 for all other scenarios you wish to calculate



Step 7. Creating a PMI/MEI Report

If you don't wish to create a PMI/MEI report, skip to Step 8.

1a. On the ***Step-Through*** window, click ***Step 5***. This will open the ***PMI/MEI Report*** window.

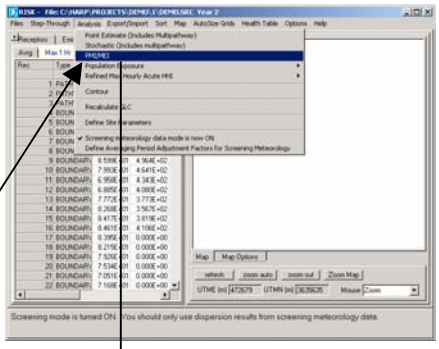
or

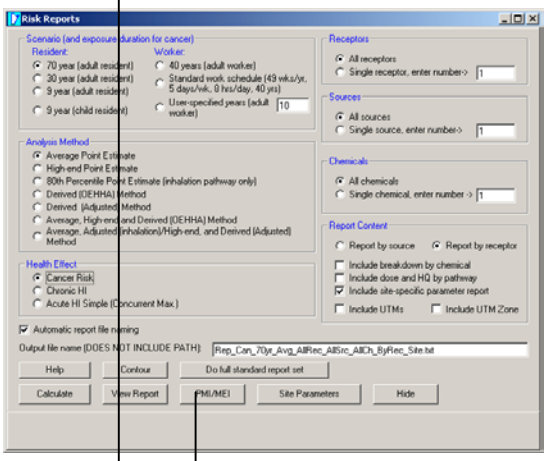
1b. From the main ***Risk*** window, select ***Analysis/PMI/MEI***. This will open the ***PMI/MEI Report*** window.

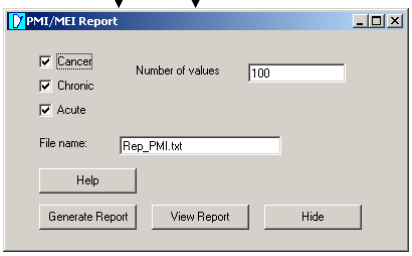
or

1c. From the ***Risk Reports*** window, click on the ***PMI/MEI*** button. This will open the ***PMI/MEI Report*** window.

2. Place a check next to each health effect (cancer, chronic, acute) you wish to include. Verify the number of values you want in the report, and the file name.
3. Click ***Generate Report***. HARP will show you a preview of the report. Save the report to your project directory. Close the Report. Then close the ***PMI/MEI Report*** window.







Step 8. Creating a Contour

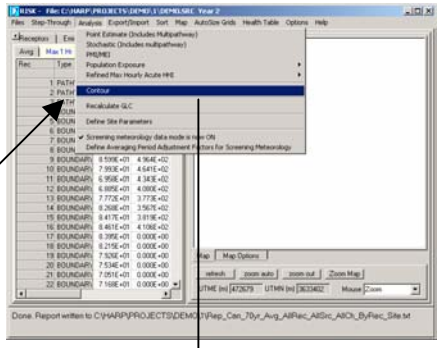
1a. On the ***Step-Through*** window, click ***Step 6***. This will open the ***Contour*** window.

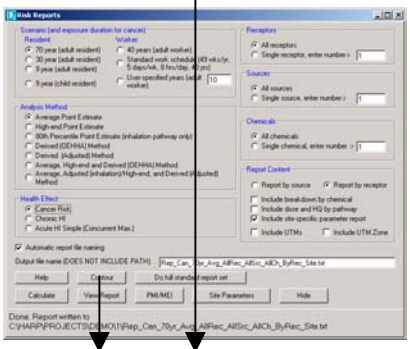
or

1b. From the main ***Risk*** window, select ***Analysis/Contour***. This will open the ***Contour*** window.

or

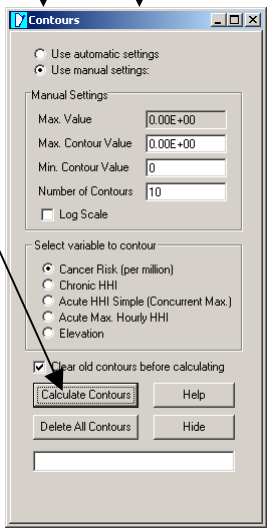
1c. From the ***Risk Reports*** window, click on the ***Contour*** button. This will open the ***Contour*** window.





2.a Automatic Settings: The automatic settings will create contours that bound the risk data between the highest risk value and zero. The number of contours that you define will divide the risk results into evenly spaced intervals between these two points.

Select the button next to ***Use automatic settings***. Select ***Cancer Risk*** to contour the cancer risk. Click ***Calculate Contours***. The mapped results will appear on the ***Risk*** window.



2.b Manual Settings: To manually identify the contours, check the box ***Use Manual Setting***. The number of contours should be one number greater than the number of intervals that you want your data divided into (i.e., if 5 intervals of data is desired, enter 6 contours).

For example, if you want to see just two isopleths at 1 and 10 chances per million: Set the ***Max. Contour Value*** to 10 and the Set ***Min. Contour Value*** to 1, and set ***Number of Contours*** to 2. Click ***Calculate Contours***. The contours will be displayed on the map when the calculation is done.

Important Notes on Contours

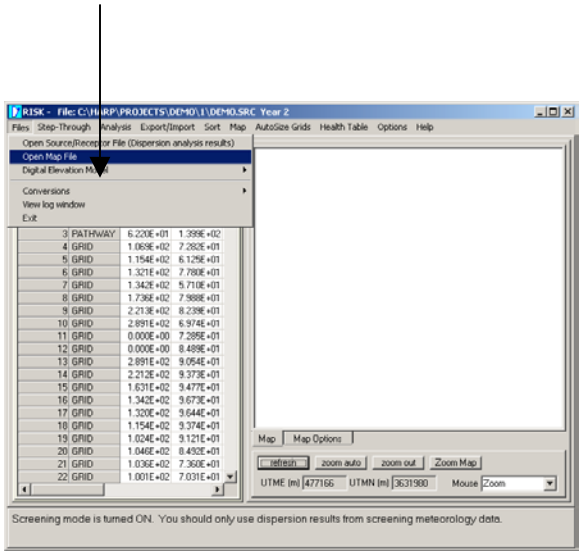
- The contour isopleths can only be generated using grid receptors.
- HARP will plot the last risk that was calculated. If you choose to run a risk analysis for "average, high-end and derived", the risk contours that will be plotted will be for "derived". If you run the OEHHA standard report set, HARP will plot the 70-year, cancer, derived (adjusted) scenario from Report #19.
- HARP plots contours in units of "per million".
- If HARP will not calculate the contours, there may not be enough data. At least three points of data (grid receptors) at that contour range are needed to make an isopleth. You should also look at your risk data to confirm that your maximum and minimum contour values are within the range of your data or you may need to rerun the dispersion analysis with smaller grid spacing.

Step 9. Opening a Street Map

1a. On the ***Step-Through*** window, click ***Step 7***. Browse to the map you wish to load. Click ***Open*** button.

or

1b. From the main ***Risk window***, select ***Files/Open Map File***. Browse to the map you wish to load. Click ***Open*** button.



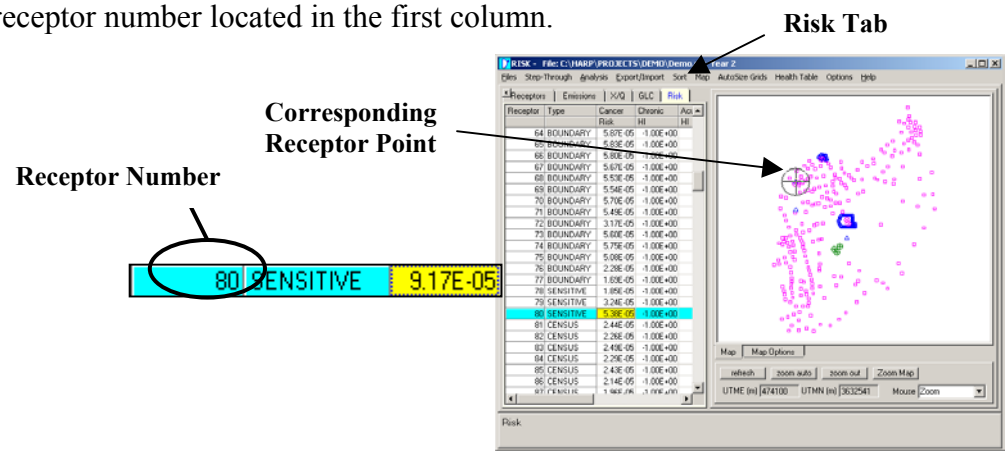
Topic 7: How to Perform a Stochastic Evaluation

Prerequisites

Before you can conduct a stochastic evaluation, you must first add your emissions data into the CEIDARS-Lite emissions inventory database within HARP and run an air dispersion analysis (See Topics 2 and 5 in the HARP How-To Guides for instructions). For more information on setting up a stochastic analysis, see Chapters 4 and 10 in the HARP User Guide.

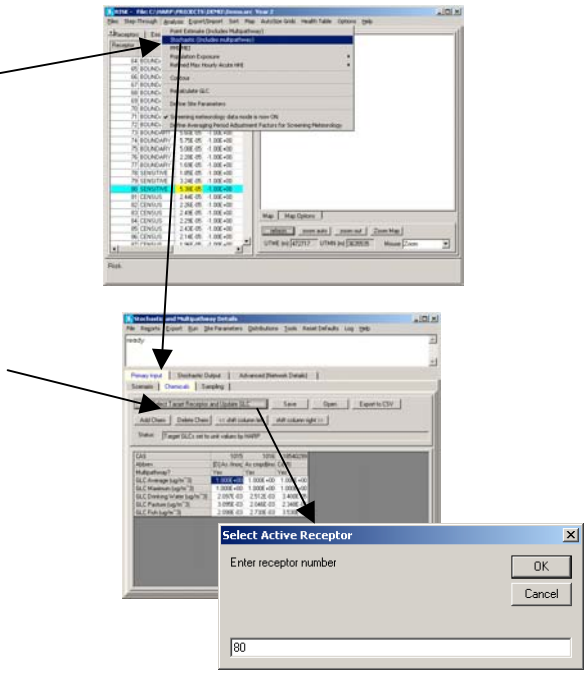
Step 1. Choosing a Receptor

The first step in conducting a stochastic evaluation is choosing a receptor. To do this, access the risk analysis module from the HARP main menu and run a point estimate risk analysis as described in Topic 6 in the HARP How-To Guides. Examine the results by clicking the ***Risk*** tab in the ***Risk*** window. Choose the receptor that you would like to run a stochastic analysis on and note the receptor number located in the first column.



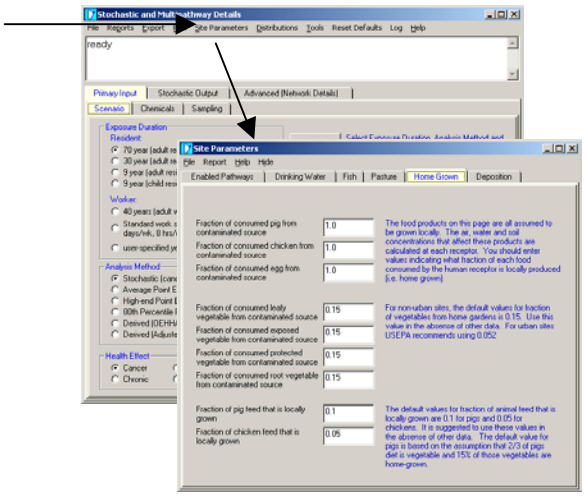
Step 2. Setting up and Running a Stochastic Simulation

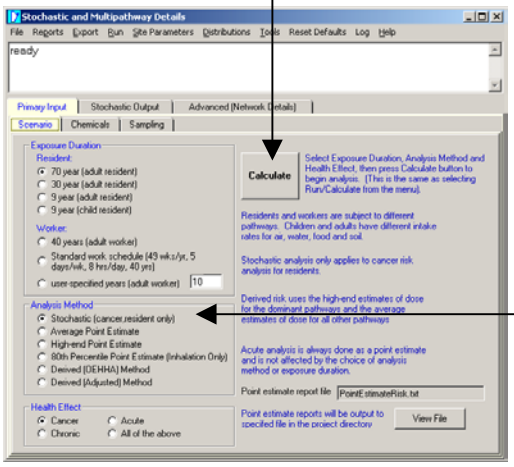
1. From the main ***Risk*** window, select ***Analysis/Stochastic (Includes Multipathway)***
2. Select the ***Primary Input*** tab and then click the ***Chemicals*** tab to access the chemical concentration data.
3. Click the button labeled ***Select Target Receptor and Update GLC*** and enter the receptor number that you noted in Step 1 into the popup window. HARP will then load the chemical names and ground level concentrations from your receptor.



Note 1: You may add a new chemical to the list by pressing the *Add Chem* button. You may delete a chemical from the list by pressing the *Delete* button. This does not affect any of the numbers on the main *Risk* window or in the HARP database.

4. Select the ***Site Parameters*** from the top menu and verify that the parameters are correct for your site. To save any changes, click ***File/Save As*** and then close the window by clicking on ***Hide***.
5. Next, set the sampling parameters by clicking the ***Sampling*** tab and set the sampling parameters.
6. Set the exposure duration, analysis method and health effect under the ***Scenario*** tab. Make sure stochastic is checked in the analysis method.
7. Finally, press the ***Calculate*** button to start the simulation.



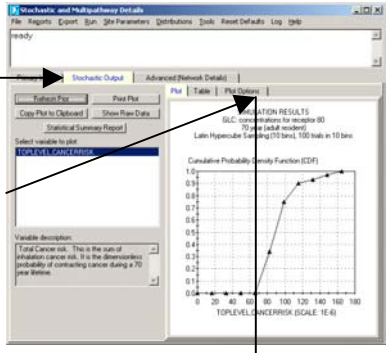


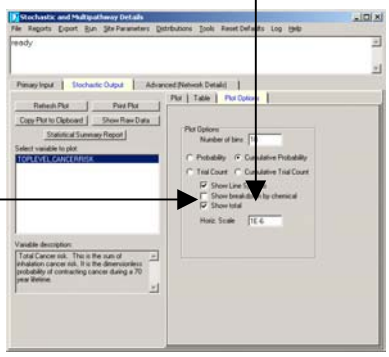
Note 2: As the scenario window indicates, you have the option of performing point estimate risk analysis at this point also. However, it will only be for a single receptor.

Make sure that "Stochastic" is selected under the analysis method.

Step 3. Viewing the Results

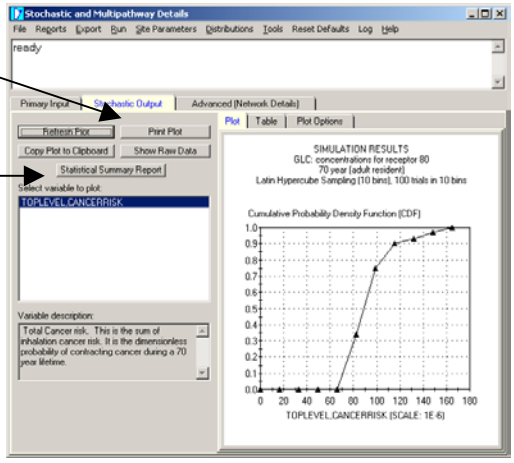
1. To view the results, click on the ***Stochastic Output*** tab and click on the ***Refresh Plot*** button. The graph shown is the cumulative probability distribution of cancer risk.
2. To change the graph, click on the ***Plot Options*** tab. From here, you may select a different plot type or change the horizontal scale. Press ***Refresh Plot*** to update the graph.
3. It is recommended that you change the scale to an appropriate one for plotting cancer risk. To do this, type "1E-6" into to ***Horiz. Scale*** field. This scales all values on the horizontal axis by multiplying them by 1,000,000. Press ***Refresh Plot*** to update the graph.
4. To display the statistical risk distribution for each of the chemicals individually, check the box next to ***Breakdown by Chemical*** in ***Plot Options***. Then press ***Refresh Plot*** to update the graph. For more information on changing the plot options and saving other variables to plot, see Chapter 10 in the HARP User Guide.

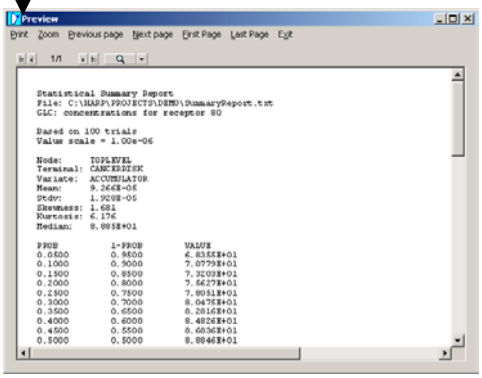




Step 4. Printing the Results and Generating a Statistical Summary Report

1. To print the graph, click on the ***Print Plot*** button.
2. To create a summary report, click ***on Statistical Summary Report*** button.
3. Once the report has been generated, a window will popup showing a preview of the report. Click Print to save the report to a file (See Note 4).

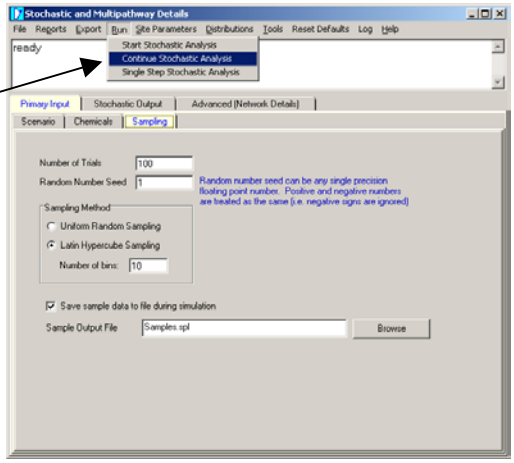




Note 4: The report will be written in the project directory. The report is an ASCII file that can be imported into a word processor.

Step 5. Continuing a Simulation

1. Select the ***Primary Input*** tab and then the ***Sampling*** tab.
2. Set the number of trials. Select ***Run/Continue Stochastic***.
3. The simulation now continues from where it left off. If it is not interrupted, it will continue until the total of number of trials have been executed. For example, your first run consists of 100 trials. After analyzing the results, you wish to continue the simulation to 200 trials. Set the number of trials to 100 and select ***Run/Continue Stochastic***. The simulation starts at 105 and continues until 200.



Topic 8: How to Perform Health Analyses Using a Ground Level Concentration

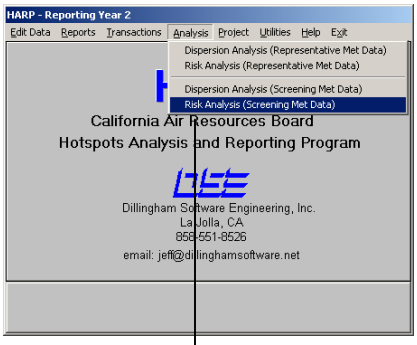
This topic addresses how to run a health analysis by manually inputting a GLC value for one or more substances using the results from an outside air dispersion run. There are two paths described below that can be used to achieve this analysis. In future releases, HARP will address the need for electronically accepting the output from an air dispersion modeling run that is performed outside of the HARP Software. For more information on setting up a risk analysis, see Chapters 4 and 10 in the HARP User Guide.

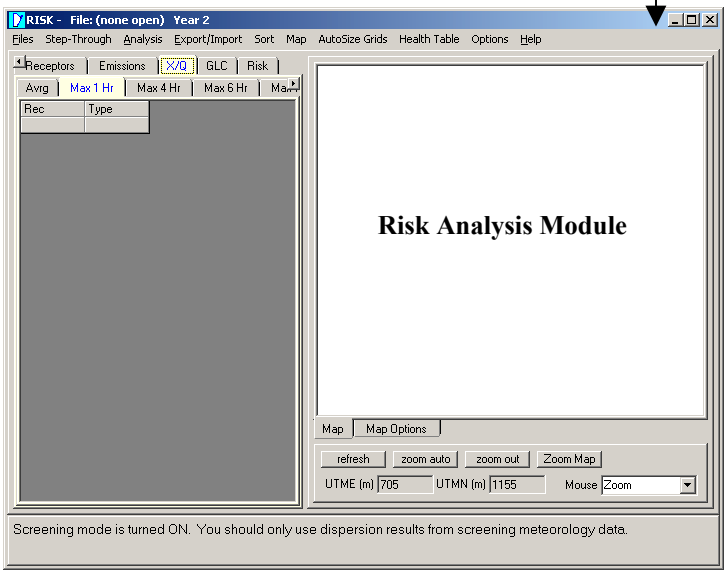
A. Adding a Substance-Specific GLC as a Background Concentration and Running a Point-Estimate Health Risk Analysis

The first method will allow you add a GLC for each substance across an entire receptor grid and run a multipathway point-estimate risk analysis. This method could be used for evaluating the contribution of background pollutants. Substance- specific GLC values can be added through the emissions information in the risk window as a background concentration. The GLC value that you enter will be applied to every receptor in the file as a background concentration.

Step 1. Opening the Risk Analysis Module

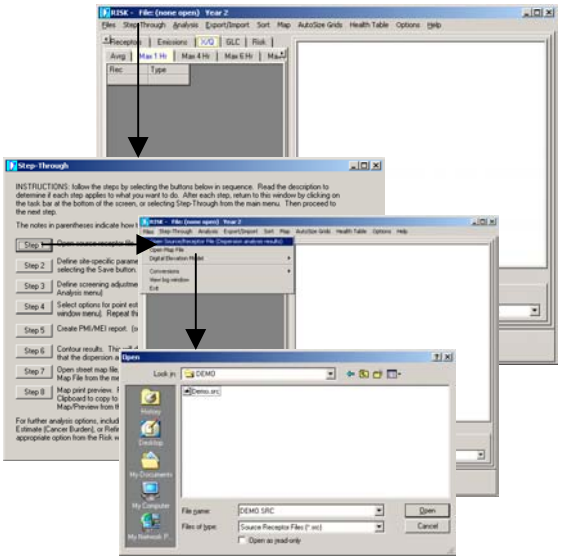
1. From the HARP main menu, select ***Analysis***.
   - If you have completed an air dispersion analysis using representative meteorology, select ***Risk Analysis (Representative Met Data)***.
   - If you have completed an air dispersion analysis using screening meteorology data, select ***Risk Analysis (Screening Met Data)***.





Step 2. Opening the Source/Receptor (SRC) File

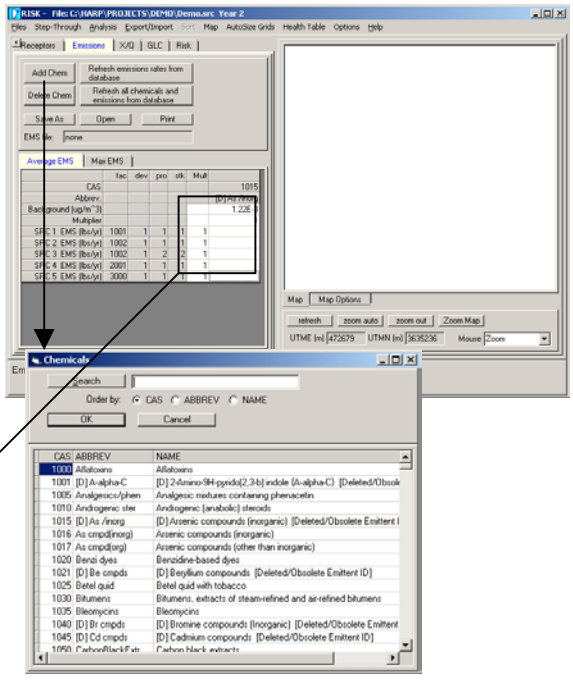
Use the Step-Through window to access SCR file. Open the SRC file for your project or use the demo SRC file (C:\HARP\PROJECTS\DEMO\Demo.src). This demo SRC file provides a surrogate receptor grid from an air dispersion modeling run. This file will be used as a template when inserting your background GLC value.



1. To open the Step-Through window, click on the ***Step-Through*** menu item at the top of the main Risk window.
2. On the ***Step-Through*** window, click ***Step 1***. Click on the desired SRC file. Click ***Open***. If you have previously used this SRC file to calculate risk, HARP will ask if you want to load the most recent risk calculations associated with this SRC file. Click ***NO***, if you are going to do more calculations using this data. Click ***YES***, if the point estimate risk data calculations are complete and you are viewing, printing, or conducting a stochastic analysis.

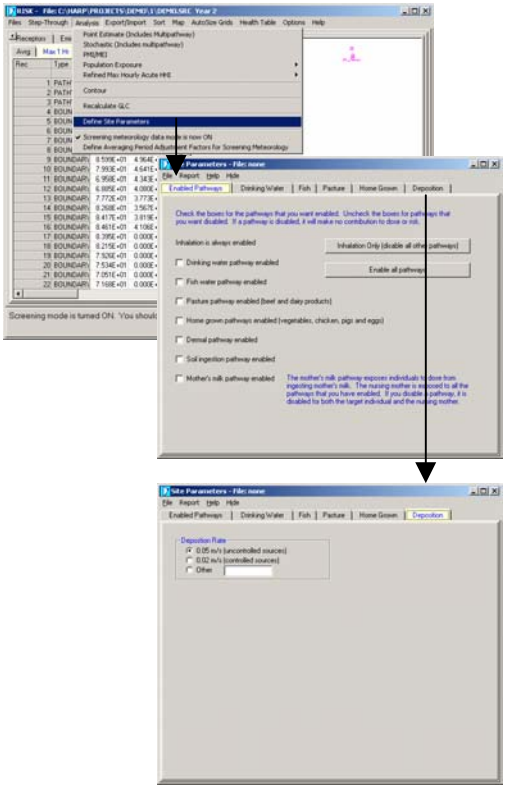
Step 3. Define the Pollutants and the Background Concentrations

Identify the pollutants of interest and specify the ground level concentration for each pollutant (See Chapter 10 in the HARP User Guide for more information).



1. Click on the ***Emissions tab***.
2. Add and/or delete chemicals using the ***Add Chem*** or ***Delete Chem*** buttons.
3. To delete a chemical from the emissions page, highlight the column for that substance and press the ***Delete Chem*** button.
4. To add a chemical, select the ***Add Chem*** Button and the screen on the right shows up. Enter the name of the chemical in the blank and press ***Search***. A list of pollutants will appear for you to select from. Highlight the pollutant of interest and press ***OK.*** The substance will be added to the list of pollutants on the Emissions Page.
3. For each substance that is included in the background assessment, insert the GLC value into the background row, insert a one (1) into the multiplier row, and blank out the source emissions for each substance.

Step 4. Defining Site-Specific Parameters



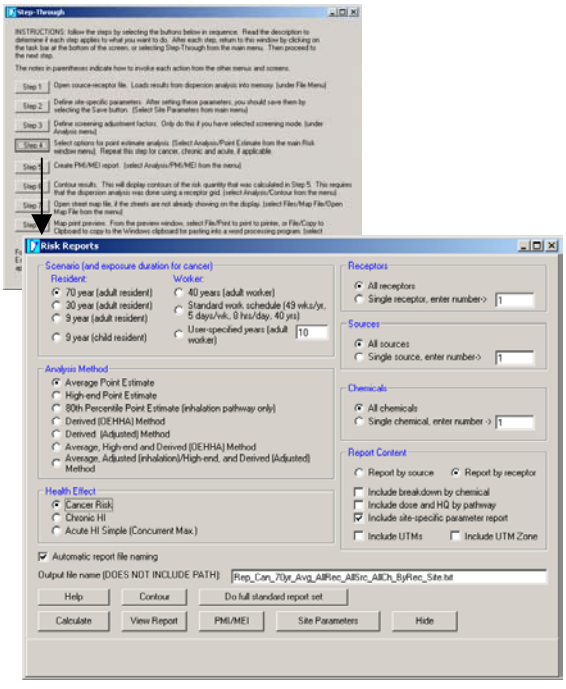
1a. On the ***Step-Through*** window, click ***Step 2***. This will open the ***Site Parameters*** window.

or

1b. From the main ***Risk*** window, select ***Analysis/Define Site Parameters***. This will open the ***Site Parameters*** window.

2. Click on the ***Enabled Pathways*** tab.
3. Place a check next to each pathway you wish to include in the point estimate risk analysis.
4. If you enable the drinking water, fish, pasture, and homegrown pathways you will need to add the required information in the corresponding tabs.
5. Choose a deposition rate under the ***Deposition*** tab.
6. Click ***File/Save As*** if you wish to save the file.
7. Click ***Hide*** to close the ***Site-Specific Parameters*** window.

Step 5. Set up the Point-Estimate Risk Analysis



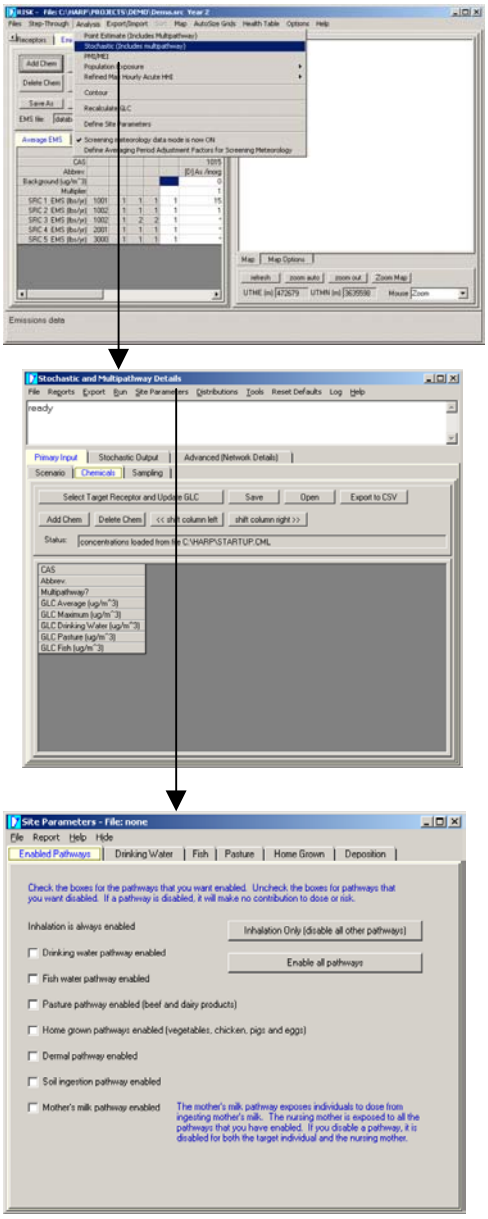
1. On the ***Step-Through*** window, click ***Step 4***. This will open the ***Risk Reports*** window. (See Topic 5 in the HARP How-To Guides or Chapter 10 in HARP User Guide for more information).
2. Click on the button next to each item that you would like to include in the risk analysis.
3. Click ***Calculate***. HARP will show you a preview of the report. Close Report.
4. At this point, the risk values will be added to the data view window. Click on the risk tab on the right side of the main risk window. The cancer, chronic, and acute risk values will be displayed. If no value has been calculated a –1.00E+00 will be displayed for each receptor.
5. Repeat steps 2-3 for all other scenarios you wish to calculate

B. Performing a Stochastic Risk Analysis for a Single Receptor Without A Dispersion Analysis

The second method will allow you to analyze a single receptor only, but you can enter different GLC values for the target receptor and each of the three pathway receptors. This second method will allow you to run a multipathway point-estimate or stochastic analysis. This is done by entering the ground level concentrations directly on the *Stochastic and Multipathway Details* window and proceeding with the risk analysis without ever running a separate dispersion analysis. To perform the second method, see the steps below or refer to Chapter 10 in the HARP User Guide. Topic 7 in the HARP How-To Guides describes how to run a stochastic analysis.

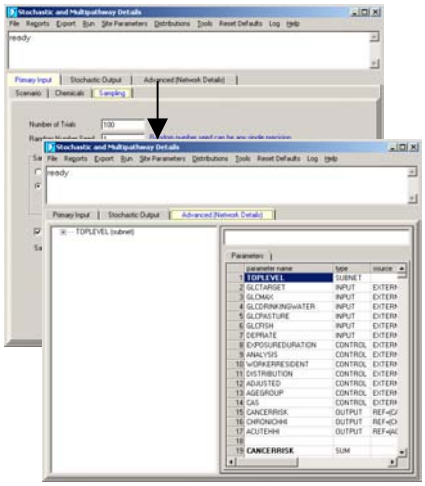
Step1. Setting up and Running a Stochastic Simulation

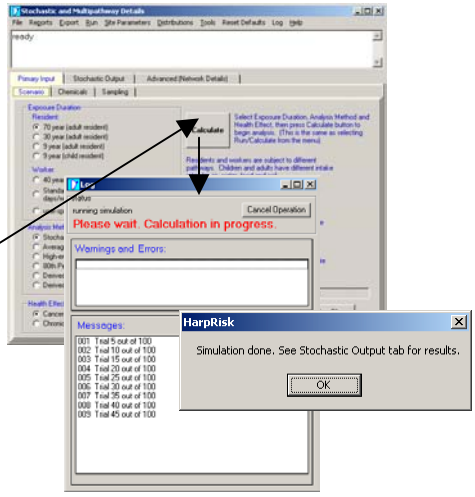
1. From the main ***Risk*** window, select ***Analysis/Stochastic (Includes Multipathway)***
2. Select the ***Primary Input*** tab and then click the ***Chemicals*** tab to access the chemical concentration data.
3. Use the ***Add Chem*** or ***Delete Chem*** buttons to create the list of pollutants. The method is the same as described in Step 3 above.
4. Enter the ground level concentrations at the location(s) of interest. The drinking water, pasture, and fish GLC's are used for multipathway analysis.
5. Select the ***Site Parameters*** from the top menu and verify that the parameters are correct for your site. If you enable the drinking water, fish, pasture, and homegrown pathways you will need to add the required information in the corresponding tabs. To save any changes beyond this run, click ***File/Save As*** and then close the window by clicking on ***Hide***.

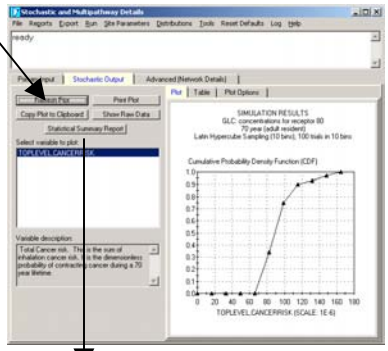


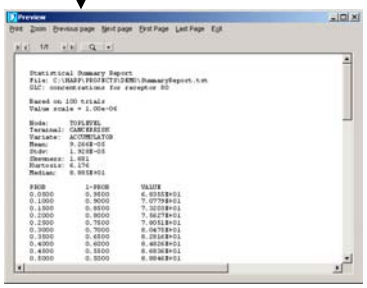
6. Next, set the sampling parameters by clicking the ***Sampling*** tab and set the sampling parameters (i.e., number of trials, random number seed, sampling type, and bins).
7. Identify the variable(s) to plot for viewing. The default plot is the total cancer risk. Use the ***Advanced Network Details*** button to identify any additional variables that you want to keep a record of for plotting. See Chapter 10 in the HARP User Guide and Topic 7 in the HARP How-To Guides for more information on plotting features.
8. Set the exposure duration, analysis method, and health effect under the ***Scenario*** tab. Make sure stochastic is checked in the analysis method. Note that if you only want a point-estimate report, not a stochastic analysis, you can select one of the point-estimate options under the *Analysis Method* section under the Scenario tab.
9. Identify the Plot Press the ***Calculate*** button to start the simulation.
10. Once the simulation is complete, press ***Refresh Plot*** and the plot that is highlighted will appear in the window.
11. Press the button, ***Statistical Summary Report*** to produce a tabular report. This will be saved to a file and folder that you designate, but will open automatically in HARP after it is named.

See Chapter 10 in the HARP User Guide and Topic 7 in the HARP How-To Guides for more information on viewing results, plot options, and contouring maps.









Appendix B

File Types Used and Created by HARP

Appendix B

File Types Used and Created by HARP

File Extension	File Type	More Information
*.adj	Adjustment factors	Contains averaging period adjustment factors to be used with screening meteorology. This file is created from the adjustment factors window under the analysis menu of the risk window.
*.bin	Bin file	This binary file contains hourly X/Q values for each source-receptor combination. It is used for calculating maximum hourly acute risk.
*.cml	Chemical concentrations	This file contains chemical concentrations (GLCs) at a single receptor that can be used for risk analysis. The file is created from the chemicals tab of the Stochastic and Multipathway window.
*.csv	Comma separated variables	CSV files are created when you select Export/Export All Details from the risk window. Various files with this extension are created, one for each of the exported tables representing GLC, X/Q and risk. CSV files can be opened with Excel as tables.
*.dat	Coordinate conversion data	These files are located in your HARP directory and are used by the coordinate conversion routines. Do not move or modify these files.
*.dem	Digital elevation model file	Used to calculate elevations for stacks and receptors.
*.ems	Emission rates file	A table of chemical names and emission rates can be created and saved for use in future risk analysis. EMS files are created, edited and saved from the emissions tab of the Risk window.
*.ini	HARP initialization file	This file tells HARP where to save all of the files it creates (e.g., c:\HARP\projects\…).
*.err	ISC Error file	This file contains a list of all warning and error messages generated by ISC. The file is created each time you run ISC from the dispersion window. This file is also displayed in a preview window by HARP at the end of an ISC run.
*.grd	Geographic transformation file	The file egm96.grd is located in your HARP directory and is used by the coordinate conversion routines. Do not move or modify this file.
*.inp	ISC input file	This file is the primary input file for ISC. This file is created by HARP with the information added by the user in the Dispersion Analysis Module. It describes the sources, receptors, input and output options to be used by ISC in the analysis.

File Extension	File Type	More Information
*.isc	ISC Workbook input file	Dispersion Analysis input workbook. It stores all of the ISC input parameters. The information for this file is created under the Dispersion Analysis window.
*.log	BPIP log file	Log file created by BPIP. BPIP is run automatically by HARP when HARP builds the ISC input file.
*.map	Map File	Map files used by HARP in the risk module.
*.max	ISC Max file	Contains a list of all receptors whose concentration values exceed some specified threshold during the simulation. Generated by ISC according to the parameters that the user specifies on the *Output* control sheet of the Dispersion Workbook.
*.met	Meteorology file	Read by ISC. This file contains time series of wind velocity and direction, and various other parameters describing the wind profile.
*.mdb	Access 2000 database file	There are two *.mdb files used by HARP. HEALTH.MDB is the file with the health value information for each substance in the Hot Spots Program. All facility and emissions data is kept in the HARP.MDB file. This file can be renamed to fit your project. The contents of HARP.MDB largely mirror the CEIDARS database.
*.out	ISC output file	The primary ISC output file. This file contains an echo of the input, a summary of the results, and error messages.
*.par	Multipathway network parameter file.	The multipathway network parameters and be edited interactively under the Network Details tab of the Multipathway and Stochastic window. This file is used to store and retrieve your customized settings. Changing the network parameters is for advanced and administrative use, and is not generally recommended.
*.plt	ISC plot file	This is the standard plot file created by ISC during each run. It is an ASCII file that can be imported into a spreadsheet or other plotting program.
*.pol	Pollutant list	This is a list of chemicals that is used to customize reports. Pol lists can be created, edited and saved by the user. See the emission summary report window under the Reports menu of the main HARP program.

File Extension	File Type	More Information
*.pst	ISC Post file	This is the standard POST file generated by ISC. The contents of this report are controlled by the parameters on the Output tab of the Dispersion window. It contains UTM coordinates and pollutant concentrations at each receptor point, from each source, for each step of the simulation.
*.rsk	HARP Risk file	Contains point estimate risk values generated by HARP in the Risk Analysis module.
*.sit	Site parameters file	This file contains site-specific parameters used in multipathway risk analysis. This file can be created and edited by selecting *Analysis/Define Site Parameters* from the menu of the HARP risk window.
*.spl	Stochastic sample file	This file contains a list of samples created during stochastic risk analysis. The file is specified under the Primary Input/Sampling tab of the Stochastic window. Saved sample files can be later reloaded and analysed.
*.src	HARP source receptor file	This file is created by HARP when the dispersion analysis is run. It contains a list of the sources and receptors that were used in the ISC input and information that connects the dispersion results to the corresponding stack information in the HARP Facility Database. This information is used to perform the risk analysis.
*.sum	BPIP summary file	This is a summary output file generated by BPIP. BPIP is run automatically by HARP when HARP builds the ISC input file, provided there are buildings present.
*.tem	HARP transaction template file	Transaction template files. These files are stored in a HARP subdirectory and specify the sequence of data fields for each record type in a HARP/CEIDARS transaction file. You should not modify these files.
*.tra	HARP Transaction file	These files are in ASCII format and can be used to transmit emissions inventory data from one computer to another.
*.txt	HARP Text file	All reports generated by HARP are in a text file format.
*.xoq	HARP X/Q file	This file contains the X/Q values, also known as dilution factors, that are output by ISC. The XOQ file is read by the HARP risk module after the ISC run. X/Q's are multiplied by emission rates to get ground level concentrations.

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CEIDARS 2.5

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SECTION ONE

CORE DATA TABLES

Table FACILITY - Facility Information
(Primary Key: CO + FACID + AB + DIS)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	CO	NUMBER	2		NOT NULL	County Number
2	FACID	NUMBER	9		NOT NULL	Facility ID Range: 1 - 999999999
3	AB	CHAR	3		NOT NULL	Air Basin Domain: Table COABDIS
4	DIS	CHAR	3		NOT NULL	Responsible District
5	FRS_ID	CHAR	12		NULL	EPA Facility Registry System Identification [ARB use]
6	GEOID	CHAR	25		NULL	Special Project ID Format YYYY_CO_AB_DIS_FACID [ARB use]
7	FNAME	CHAR	60		NULL	Name of Facility at Location
8	FSTREET	CHAR	60		NULL	Street Where Facility Is Located
9	FCITY	CHAR	20		NULL	City Where Facility Is Located
10	FZIP	CHAR	5		NULL	Facility ZIP Code Range: 90000 - 99999
11	FZIPEXT	CHAR	4		NULL	Facility ZIP Code Extension Range: 0 - 9999 Domain: Table COABDIS
12	PCONTACT	CHAR	24		NULL	Phone Contact Person
13	AREAC	NUMBER	3		NULL	Telephone Area Code
14	PHONE	NUMBER	7		NULL	Telephone Number
15	FSIC	NUMBER	4		NOT NULL	Facility SIC Domain: Table SIC
16	FNAICS	CHAR	6		NULL	Facility North American Industry Classification System Code Domain: Table NAICS
17	NEMP	NUMBER	5		NULL	Number of Employees
18	COORD_SYS	CHAR	3		NULL	Coordinate System Used Domain: DD - Decimal Degrees TA - Teale Albers, meters U10- UTM10, kilometers U11- UTM11, kilometers
19	DATUM	CHAR	5		NULL	Type of Datum Used Domain: NAD27 – North American Datum 1927 NAD83 – North American Datum 1983 WGS84 – World Geodetic System 1984
20	SPHEROID	CHAR	10		NULL	Shape Used for Ellipsoidal Earth Domain: Clarke1866 – Clarke 1866 GRS80 – Geodetic Reference System 1980 WGS84 - World Geodetic System 1984 WGS72 - World Geodetic System 1972
21	X_USERCOORD	NUMBER	12	6	NULL	X (East) Coordinate in COORD_SYS Units
22	Y_USERCOORD	NUMBER	13	6	NULL	Y (North) Coordinate in COORD_SYS Units
23	LOC_METH	CHAR	3		NULL	Method of Collecting Data Domain: Table DEFLOCATION
24	UZ	NUMBER	2		NULL	UTM Zone [ARB use]
25	UE_NAD83	NUMBER	8	2	NULL	NAD83 UTM East in meters [ARB use] Domain: UTMEAST
26	UN_NAD83	NUMBER	9	2	NULL	NAD83 UTM North in meters [ARB use] Domain: UTMNORTH

Table FACILITY - Facility Information (Continued)
(Primary Key: CO + FACID + AB + DIS

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
27	LAT_NAD83	NUMBER	8	6	NULL	NAD83 Latitude in decimal degrees [ARB use]
28	LON_NAD83	NUMBER	9	6	NULL	NAD83 Longitude in decimal degrees [ARB use]
29	ARB_LOC_METH	CHAR	3		NULL	Code to indicate the ARB method to determine LAT_NAD83 and LON_NAD83 [ARB use] Domain: Table DEFLOCATION
30	X_TA83	NUMBER	8	2	NULL	X Coordinate in Teale Albers NAD83, meters [ARB use]
31	Y_TA83	NUMBER	9	2	NULL	Y Coordinate in Teale Albers NAD83, meters [ARB use]
32	MNAME	CHAR	60		NULL	Company Name for Mailing Purpose
33	MSTREET	CHAR	60		NULL	Company Mailing Street
34	MCITY	CHAR	20		NULL	Company Mailing City
35	MSTATE	CHAR	2		NULL	Company Mailing State
36	MZIP	CHAR	5		NULL	Mail Zip Code Range: 1 - 99999
37	MZIPEXT	CHAR	4		NULL	Mail Zip Code Extension Range: 0 - 9999
38	MCONTACT	CHAR	24		NULL	Mail Contact Person
39	AQCR	NUMBER	2		NULL	EPA Air Quality Control Region
40	FACSUBCO	CHAR	4		NULL	Facility Sub-county Identifier Domain: Table SUBCO
41	CODESIG	CHAR	1		NULL	Area Designation for CO Domain: A - Attainment N - Non-attainment T - Non-attainment - Transitional U - Unclassified
42	N02DESIG	CHAR	1		NULL	Area Designation for $N0_2$ Domain: A - Attainment N - Non-attainment T - Non-attainment - Transitional U - Unclassified
43	OZDESIG	CHAR	1		NULL	Area Designation for Ozone Domain: A - Attainment N - Non-attainment T - Non-attainment - Transitional U - Unclassified
44	PMDESIG	CHAR	1		NULL	Area Designation for Particulate Domain: A - Attainment N - Non-attainment T - Non-attainment - Transitional U - Unclassified
45	S02DESIG	CHAR	1		NULL	Area Designation for $S0_2$ Domain: A - Attainment N - Non-attainment T - Non-attainment - Transitional U - Unclassified

Table FACILITY - Facility Information (Continued)
(Primary Key: CO + FACID + AB + DIS)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
46	FAC_PHASE	CHAR	2		NULL	Phase Facility Brought into Program P1 - 1st Phase, >=25 TPY or Tox. Inv. Fac. P2 - 2nd Phase, >=10 TPY & <25 Tpy Fac. P3 - 3rd Phase, <10 TPY
47	FEE_CAT	CHAR	1		NULL	Toxic Program Status A Prioritization score > 10.0 B HRA >= 10 and less than 50 C HRA >= 50 and less than 100 D HRA >= 100 E Unprioritized (new facility) F HRA >= 1 and less than 10 G Exempt H Exempt, HRA < 1 M Out, de minimus O Out of business P Exempt, prioritization score < 1.0 U District update facility - Prioritization Score greater than 1 and <= 10
48	FAC_FORECAST	CHAR	1		NULL	Fac. Used for Forecasting Purposes Domain: N - NSR Facility
49	PRIORITY	CHAR	1		NULL	Priority for Hot Spots Risk levels Domain: H - High I - Intermediate L - Low
50	INDUSTRYWIDE	CHAR	1		NULL	Included in Industry Wide Domain: Y - Yes; N – No
51	SMALL_COMM	CHAR	1		NULL	Is Facility a Small Commercial Facility (i.e., Aggregated Point Source)? Domain: Y/N (May be expanded in future to use codes for specific types.)
52	FAC_LOC_ONLY	CHAR	1		NULL	Is the Facility record for a "Location Only" facility? (Used for certain small facilities for which location is known but site-specific emissions are not available, for example for gasoline stations for CHAPIS mapping.) Domain: Y/N
53	CERR_CODE	CHAR	1		NULL	Consolidated Emission Reporting Rule Identification Domain: A/B
54	FAC_UPDATE	CHAR	6		NULL	Updating Code Domain: SIP: SIP facility ANN: Annual Update AB2588: AB2588 Update CHS: CHAPIS Update ALM : Almanac Update
55	MAINTAINED	CHAR	1		NULL	Is this Facility one that is being regularly maintained by the districts, for example, more frequently than the 4-year Hot Spots update cycle for toxics facilities? Domain: Y/N

Table FACILITY - Facility Information (Continued)
(Primary Key: CO + FACID + AB + DIS)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
56	CHAPIS	CHAR	1		NULL	CHAPIS facility Domain: Y/N
57	TOX_CRIT_FLAG	CHAR	1		NULL	Toxic/Criteria Facility Flag [ARB use] Domain: T: Toxic Facility C: Criteria Facility B: Both
58	VINTAGE_EMS	NUMBER	4		NULL	Year of Emissions Data
59	SIC_FEEREG	NUMBER	4		NULL	SIC Code for facility in Fee Regulation
60	EXEMPT	CHAR	50		NULL	Exemption status and reason
61	SMALL_BUS	CHAR	1		NULL	Small business?
62	VINTAGE_RISK	NUMBER	4		NULL	Year of Risk Data
63	VINTAGE_PS	NUMBER	4		NULL	Year of Prioritization Score
64	NUM_SCC	NUMBER	3		NULL	Number of SCC used by facility
65	PROXIMITY	NUMBER	9	2	NULL	Receptor Proximity, meters
66	CANCEREPP	NUMBER	8	2	NULL	Cancer Priority Score, Emissions and Potency Procedure
67	NONCANCEREPP	NUMBER	7	2	NULL	Noncancer Priority Score, Emissions and Potency Procedure
68	ACUTEEPP	NUMBER	7	2	NULL	Acute Priority Score, Emissions and Potency Procedure
69	CHRONICEPP	NUMBER	7	2	NULL	Chronic Priority Score, Emissions and Potency Procedure
70	CANCERDAP	NUMBER	8	2	NULL	Cancer Priority Score, Dispersion Adjustment Procedure
71	NONCANCERDAP	NUMBER	7	2	NULL	Noncancer Priority Score, Dispersion Adjustment Procedure
72	ACUTEDAP	NUMBER	7	2	NULL	Acute Priority Score, Dispersion Adjustment Procedure
73	CHRONICDAP	NUMBER	7	2	NULL	Chronic Priority Score, Dispersion Adjustment Procedure
74	TS	NUMBER	8	2	NULL	Total Priority Score
75	PRIORITY_MULT	NUMBER	6	2	NULL	Priority Multiplier
76	HRA_CAN	NUMBER	7	2	NULL	Health Risk Assessment Cancer Risk
77	CHRONIC_HI	NUMBER	7	2	NULL	Chronic Hazard Index
78	ACUTE_HI	NUMBER	7	2	NULL	Acute Hazard Index
79	FACD1	CHAR	9		NULL	Reserved for District Use
80	FACD2	CHAR	9		NULL	Reserved for District Use
81	FACU	DATE	8		NULL	Date of Last Update
82	FACU_D	DATE	8		NULL	Date District Last Updated
83	MEMO_FAC	CHAR	80		NULL	Comments on Facility [District option]

Table STACK - Stack Information
(Primary Key: CO + FACID + AB + DIS + STK)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	CO	NUMBER	2		NOT NULL	County Number Domain: Table COABDIS
2	FACID	NUMBER	9		NOT NULL	Facility ID Domain: Table FACILITY (CO + FACID + AB + DIS)

Table STACK - Stack Information (Continued)
(Primary Key: CO + FACID + AB + DIS + STK)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
3	AB	CHAR	3		NOT NULL	Air Basin Domain: Table COABDIS
4	DIS	CHAR	3		NOT NULL	District Domain: TABLE COABDIS
5	STK	NUMBER	6		NOT NULL	Stack ID Range: 1 – 999999
6	STKNAME	CHAR	60		NULL	Stack Name (optional)
7	STKHT	NUMBER	8	4		NULL Stack Height, Feet
8	STKDIAM	NUMBER	4	1	NULL	Stack Diameter at Exit, Feet
9	GT	NUMBER	5	1		NULL Actual Gas Temp at Exit, Deg. F Range: 50-2500
10	GF	NUMBER	10	2	NULL	Actual Gas Flow, Ft^3/Min
11	GV	NUMBER	8	2	NULL	Actual Gas Velocity at Exit, Ft/Min
12	GEOID	CHAR	25		NULL	Special Project ID [ARB use] Format YYYY_CO_AB_DIS_FACID
13	GEOID_STK	CHAR	32		NULL	Special Project ID for Stack [ARB use] Format YYYY_CO_AB_DIS_FACID_STK
14	COORD_SYS	CHAR	3		NULL	Coordinate System Used Domain: DD - Decimal Degrees TA - Teale Albers, meters U10- UTM10, kilometers U11- UTM11, kilometers
15	DATUM	CHAR	5		NULL	Type of Datum Used Domain: NAD27 – North American Datum 1927 NAD83 – North American Datum 1983 WGS84 – World Geodetic System 1984
16	SPHEROID	CHAR	10		NULL	Shape Used for Ellipsoidal Earth Domain: Clarke1866 – Clarke 1866 GRS80 – Geodetic Reference System 1980 WGS84 - World Geodetic System 1984 WGS72 - World Geodetic System 1972
17	SUZ	NUMBER	2		NULL	UTM zone for stack [ARB use}
18	X_USERCOORD	NUMBER	12	6	NULL	X (East) Coordinate in COORD_SYS Units
19	Y_USERCOORD	NUMBER	13	6	NULL	Y (North) Coordinate in COORD_SYS Units
20	LOC_METH	CHAR	3		NULL	Method of Collecting Data Domain: Table DEFLOCATION
21	SUTME _NAD83	NUMBER	8	2	NULL	NAD83 Stack UTM East Coordinate, meters Domain: Table UTM EAST [ARB use]
22	SUTMN_NAD83	NUMBER	9	2	NULL	NAD83 Stack UTM North Coordinate, meters Domain: Table UTM NORTH [ARB use]
23	SLAT_NAD83	NUMBER	8	6	NULL	Latitude in decimal degrees, [ARB use]
24	SLON_NAD83	NUMBER	9	6	NULL	Longitude in decimal degrees, [ARB use]
25	ARB_LOC_METH	CHAR	3		NULL	Code to indicate the ARB method to determine SLAT_NAD83 and SLON_NAD83 [ARB use] Domain: Table DEFLOCATION
26	XSTK_TA83	NUMBER	8	2	NULL	X (East) Coordinate in Teale Albers, meters [ARB use]
27	YSTK_TA83	NUMBER	9	2	NULL	Y (North) Coordinate in Teale Albers, meters [ARB use]
28	ELEV	NUMBER	7	2	NULL	Elevation in Feet

Table STACK - Stack Information (Continued)
(Primary Key: CO + FACID + AB + DIS + STK)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
29	SRCTYP	CHAR	7		NOT NULL	Type of Release, as specified in ISC. Domain: POINT VOLUME AREA OPENPIT
30	SYINIT	NUMBER	7	2	NULL	Initial Lateral Dimension of Volume Release, feet Release (Optional for Area), feet
31	SZINIT	NUMBER	7	2	NULL	Initial Vertical Dimension of Volume or Area
32	XINIT	NUMBER	7	2	NULL	Square Length or Rec. Side of Area Release, feet
33	YINIT	NUMBER	7	2	NULL	Rectangular Side of Area or Open Pit Release (Optional for Area), feet
34	ANGLE	NUMBER	5	2	NULL	Angle of Area or Open Pit Source, degree (Optional)
35	PITVOL	NUMBER	15	2	NULL	Volume of Open Pit Source, ft^3
36	ISDEFAULT	CHAR	2		NULL	Code to indicate Stack Data are default Domain: Table DEFISDEFAULT
37	STKU	DATE	8		NULL	Date of Last Update
38	STKU_D	DATE	8		NULL	Date District Last Updated
39	MEMO_STK	CHAR	80		NULL	Comments on Stack Information [District option]

Table DEVICE - Device Information
(Primary Key: CO + FACID + AB + DIS + DEV)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	CO	NUMBER	2		NOT NULL	County Number Domain: Table COABDIS
2	FACID	NUMBER	9		NOT NULL	Facility ID Domain: Table FACILITY (CO+FACID+AB+DIS)
3	AB	CHAR	3		NOT NULL	Air Basin Domain: Table COABDIS
4	DIS	CHAR	3		NOT NULL	District Domain: Table COABDIS
5	DEV	NUMBER	6		NOT NULL	Device ID Range: 1 - 999999
6	DEVNM	CHAR	40		NULL	Local Name of this Device
7	DEVCAP	NUMBER	6	2	NULL	Device Output Capacity in MegaWatts
8	PERID	CHAR	32		NULL	Local Permit ID
9	NUMDEV	NUMBER	5		NULL	Number of Devices Represented
10	EQSIZE_CF	CHAR	1		NULL	Equipment Size Confidential Flag Domain: Y - Yes N - No
C 11	EQSIZE	NUMBER	7	1	NULL	Equipment Size Range: 0 - 999999.9
12	EQUNITC	NUMBER	5		NULL	Equipment Size Units Code Domain: Table EQSIZEUNIT
13	EQTYPEC	NUMBER	5		NULL	Equipment Type Code Domain: Table EQTYPE
14	DEVSUBCO	CHAR	4		NULL	Sub-county ID Domain: Table SUBCO

Table DEVICE - Device Information (Cont.)
(Primary Key: CO + FACID + AB + DIS + DEV)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
15	SECT	NUMBER	2		NULL	Section Range: 1- 36
16	TWNSHP	NUMBER	2		NULL	Township Range: 1 - 50
17	TWNSHPB	CHAR	1		NULL	Township Base Domain: N - North S – South
18	RANGE	NUMBER	2		NULL	Range Range: 1- 50
19	RANGEB	CHAR	1		NULL	Range Base Domain: E - East W - West
20	DEVD1	CHAR	40		NULL	Reserved for District Use
21	DEVD2	CHAR	40		NULL	Reserved for District Use
22	DEVU	DATE	8		NULL	Date and Time of Last Update
23	DEVU_D	DATE	8		NULL	Date District Last Updated
24	MEMO_DEV	CHAR	80		NULL	Comments on Device Information [District option]

Table PROCESS - Process Information
(Primary Key: CO + FACID + AB +DIS + DEV + PROID)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	CO	NUMBER	2		NOT NULL	County Number Domain: Table COABDIS
2	FACID	NUMBER	9		NOT NULL	Facility ID Domain: Table FACILITY (CO+FACID+AB+DIS)
3	AB	CHAR	3		NOT NULL	Air Basin Domain: Table COABDIS
4	DIS	CHAR	3		NOT NULL	District Domain: Table COABDIS
5	DEV	NUMBER	6		NOT NULL	Device ID Domain: Table DEVICE (CO+FACID+ AB+DIS+DEV)
6	PROID	NUMBER	14		NOT NULL	Process ID Domain: If FACID > 0: 1 - 99 Else: Table EIC
C 7	PRDESC	CHAR	60		NULL	Process Description
8	SCC	NUMBER	14		NOT NULL	SCC OR EIC Domain: If Category Type is SP: Table SCC - Width = 8
9	SIC	NUMBER	14		NOT NULL	Process SIC or EIC Domain: Table SIC width = 4
10	NAICS	CHAR	6		NULL	North American Industry Classification System Code Domain: Table NAICS
C 11	PR	NUMBER			NULL	Process Rate in SCC Units

Table PROCESS - Process Information (Continued)
(Primary Key: CO + FACID + AB + DIS + DEV + PROID)

	COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
	12	PRUNITS	NUMBER	4		NULL	Process Rate Unit Code
	13	OUTPUT	NUMBER	8	2	NULL	Process Rate Output in MegaWatt-Hour
C	14	UPR	NUMBER	12	1	NULL	Unreconciled Area Source Process Rate in SCC Units Range: 0 - 99999999999.9
C	15	MAXHR_PR	NUMBER			NULL	Maximum Hourly Process Rate Note: Limit to 9 Chars. On Report Form
C	16	MAXD	NUMBER	9	3	NULL	Maximum Design Rate Range: 0 - 999999.999
C	17	HEAT	NUMBER	8		NULL	Heat Content of Fuel Used in Million BTU per SCC unit
C	18	ASH	NUMBER	4	2	NULL	Ash Content of the Fuel Used, weight percent
C	19	S	NUMBER	3	2	NULL	Percent Fuel Sulfur Content Range: 0 - 3.00
	20	PRORIG	NUMBER	3		NULL	Process Rate Origin Code Domain: Table DEFPRORIG
	21	PRREL	NUMBER	3		NULL	Process Rate Reliability
	22	STK	NUMBER	6		NULL	Stack ID Domain: Table STACK (AB+ DIS+CO+FACID+STK)
	23	HPDY	NUMBER	2		NULL	Operating Hours per Day Daily Operating Cycle Domain: Table DEFHPDY
	24	DPWK	NUMBER	2		NULL	Operating Days per Week Weekly Operating Cycle Domain: Table DEFDPWK
	25	WPYR	NUMBER	2		NULL	Operating Weeks per Year Range: 1 - 52
	26	YREST	NUMBER	4		NULL	Year of Process/Emission Estimate Made Range: 1980 to Current Year
	27	PROD1	CHAR	40		NULL	Reserved for District Use
	28	PROD2	CHAR	40		NULL	Reserved for District Use
	29	PR_FORECAST	CHAR	1		NULL	Process Specific Forecast Indicator Domain: N - NSR Process
	30	CONF	CHAR	1		NULL	Confidential Process Data Domain: Y - Yes N - No
	31	JANT	NUMBER	4	1	NULL	Percent Activity for January Range: 0- 100.0
	32	FEBT	NUMBER	4	1	NULL	Percent Activity for February Range: 0- 100.0
	33	MART	NUMBER	4	1	NULL	Percent Activity for March Range: 0- 100.0
	34	APRT	NUMBER	4	1	NULL	Percent Activity for April Range: 0- 100.0
	35	MAYT	NUMBER	4	1	NULL	Percent Activity for May Range: 0- 100.0
	36	JUNT	NUMBER	4	1	NULL	Percent Activity for June Range: 0- 100.0
	37	JULT	NUMBER	4	1	NULL	Percent Activity for July Range: 0- 100.0

Table PROCESS - Process Information (Continued)
(Primary Key: CO + FACID + AB + DIS + DEV + PROID)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
38	AUGT	NUMBER	4	1	NULL	Percent Activity for August Range: 0- 100.0
39	SEPT	NUMBER	4	1	NULL	Percent Activity for Sept. Range: 0 - 100.0
40	OCTT	NUMBER	4	1	NULL	Percent Activity for October Range: 0 - 100.0
41	NOVT	NUMBER	4	1	NULL	Percent Activity for November Range: 0- 100.0
42	DECT	NUMBER	4	1	NULL	Percent Activity for Dec. Range: 0- 100.0
43	SPATIAL	CHAR	8		NULL	Spatial Distribution Parameter
44	SEST	CHAR	6		NULL	Agency Making Area Estimate
45	PRUP	DATE	8		NULL	Date of Last Process Rate Update
46	PRUPID	CHAR	10		NULL	Person or Agency Changing Process Rate
47	MEMO_PR	CHAR	80		NULL	Comments on Process Information [District option]
48	ISDEFAULT	CHAR	2		NULL	Code to indicate link to stack ID is default. Domain: Table DEFISDEFAULT

Table EMISSION - Emissions Information
(Primary Key: CO + FACID + AB + DIS + DEV + PROID + POL)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	CO	NUMBER	2		NOT NULL	County Number Domain: Table COABDIS
2	FACID	NUMBER	9		NOT NULL	Facility ID Domain: Table FACILITY (CO+FACID+AB+DIS)
3	AB	CHAR	3		NOT NULL	Air Basin Domain: Table COABDIS
4	DIS	CHAR	3		NOT NULL	District Domain: Table COABDIS
5	DEV	NUMBER	6		NOT NULL	Device ID Domain: Table DEVICE (CO+FACID+AB+DIS+DEV)
6	PROID	NUMBER	14		NOT NULL	Process ID Domain: Table PROCESS (CO+FACID+AB+DIS+DEV+PROID)
7	POL	NUMBER	9		NOT NULL	Pollutant Code Domain: Table POLLUTANT
C 8	UEMFACT	NUMBER			NULL	Uncontrolled Emission Factor, (lbs/SCC unit) Limits to 10 Chars. On Report Form
9	CNTL1	NUMBER	3		NULL	Primary Pol. Control Device Code Domain: Table CNTLDEV
10	CNTL2	NUMBER	3		NULL	Secondary Pol. Control Device Code Domain: Table CNTLDEV
11	CNTLEFF	NUMBER	4	1	NULL	Control Efficiency (Percent) Range: 0- 100.0

Table EMISSION - Emissions Information (Continued)
(Primary Key: CO + FACID + AB + DIS + DEV + PROID + POL)

	COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
C	12	EMFACT	NUMBER			NULL	Emission Factor (Lbs/SCC Units)
C	13	EMORIG	NUMBER	3		NULL	Emission Factor Origin Code Domain: Table DEFEMORIG
	14	EMREL	NUMBER	3		NULL	Emission Factor Reliability
	15	CR_FLAG	NUMBER	1		NULL	Status of ROG/VOC/PM10/PM2.5 input [ARB use] Domain: 0 - Original Record 1 - Calculation from PM/TOG 2 - Calculation from PM10/ROG 3 - Calculation from PM2.5/VOC
	16	FRAC_1	NUMBER	5	4	NULL	Specified ROG or PM10 or NOX Fraction [ARB use] Range: 0- 1.0000
	17	FRAC_2	NUMBER	5	4	NULL	Specified VOC or PM2.5 Fraction [ARB use] Range: 0- 1.0000
	18	FRAC_3	NUMBER	5	4	NULL	Specified PM1 Fraction [ARB use] Range: 0- 1.0000
	19	EMS	NUMBER			NOT NULL	Annual Emissions Units: Tons per Year for Criteria Pol's Lbs per Year for Toxics Curies/yr for Radionuclides
	20	HRMAXEMS	NUMBER			NULL	Hourly Maximum Emissions Units: Lbs/hr Millicuries/hr for Radionuclides
C	21	METH	NUMBER	2		NULL	Emission Calculation Method Code Domain: Table DEFMETH
	22	REASCH	NUMBER	2		NULL	Reason Emission Changed Code Domain: Table DEFREASCH
	23	EXEMS	NUMBER			NULL	Total Excess Emissions Units: Tons per Year for Criteria Pol's Lbs per Year for Toxics Curies/yr for Radionuclides
	24	UNREMS	NUMBER	9	1	NULL	Unreconciled Area Emissions (Tons/year) Range: 0-99999999.9
	25	POTENTIAL	NUMBER			NULL	Potential Emissions for Districts' Use Units: Tons per Year for Criteria Pol's Lbs per Year for Toxics Curies/yr for Radionuclides
	26	MAINTAINED	CHAR	1		NULL	Flag to Indicate Whether This Emission is Agreed to be Regularly Maintained by Districts Domain: Y/N
	27	EMS_FORECAST	CHAR	1		NULL	Pollutant Specific Forecast Indicators Domain: R - Reclaim Pollutant
	28	EMSU	DATE	8		NULL	Date of Last Update
	29	EMFACUP	DATE	8		NULL	Date of Last EMFACT Update
	30	EMFACUPID	CHAR	10		NULL	Person or Agency Changing Emfact
	31	EMSUP	DATE	8		NULL	Date of Last EMS Update by District
	32	EMSUPID	CHAR	10		NULL	Person or Agency Changing EMS
	33	MEMO_EMS	CHAR	80		NULL	Comments on Emission Information [District option]

Table EXCESS - Excess Emissions Data
(Primary Key: CO + FACID + AB + DIS + DEV + PROID + POL + EXTYPE + EXQTR + EXYR)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	CO	NUMBER	2		NOT NULL	County Number Domain: Table COABDIS
2	FACID	NUMBER	9		NOT NULL	Facility ID Domain: Table FACILITY (CO+FACID+AB+DIS)
3	AB	CHAR	3		NOT NULL	Air Basin Domain: Table COABDIS
4	DIS	CHAR	3		NOT NULL	District Domain: Table COABDIS
5	DEV	NUMBER	6		NOT NULL	Device Id Domain: Table DEVICE (CO+FACID+AB+DIS+DEV)
6	PROID	NUMBER	14		NOT NULL	Process ID Domain: Table PROCESS
7	POL	NUMBER	9		NOT NULL	Pollutant ID Domain: Table POLLUTANT
8	EXTYPE	NUMBER	3		NOT NULL	Type of Excess Emissions Code Domain: Table DEFEXTYPE
9	EXQTR	NUMBER	1		NOT NULL	Quarter of Year of Excess Emissions Domain: 1 - 1st Quarter 2 - 2nd Quarter 3 - 3rd Quarter 4 - 4th Quarter
10	EXYR	NUMBER	4		NOT NULL	Calender Year of Excess Emissions
11	EXCESS	NUMBER			NULL	Excess Emissions Units: Tons/yr for Criteria Pollutants Lbs/yr for Toxics Curies/yr for Radionuclides

Table S_UP - Supplemental Use and Production Information
(Primary Key: CO + FACID + AB + DIS + POL)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	CO	NUMBER	2		NOT NULL	County Number Domain: Table COUNTY
2	FACID	NUMBER	9		NOT NULL	Facility ID Domain: Table FACLITY (CO+FACID+ DIS+AB)
3	AB	CHAR	3		NOT NULL	Air Basin
4	DIS	CHAR	3		NOT NULL	District Domain: Table COABDIS
5	POL	NUMBER	9		NOT NULL	Pollutant ID Domain: Table POLLUTANT
6	USED	CHAR	1		NULL	Is this Substance Used? Domain: Y - Yes; N - No
7	PRODUCED	CHAR	1		NULL	Is this Substance Produced? Domain: Y - Yes; N - No
8	PRESENT	CHAR	1		NULL	Is this Subst. Otherwise Present? Domain: Y - Yes; N - No
9	HOW_PRESENT	CHAR	39		NULL	How Subst. Is Otherwise Present
10	S_UPU	DATE	8		NULL	Date of Last Update

Table BLDG – Building Information
(Primary Key: CO + FACID + AB + DIS + ID + TIER)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	CO	NUMBER	2		NOT NULL	County Number Domain: Table COABDIS
2	FACID	NUMBER	9		NOT NULL	Facility ID Domain: Table FACILITY
3	AB	CHAR	3		NOT NULL	Air Basin Domain: Table COABDIS
4	DIS	CHAR	3		NOT NULL	District Domain: Table COABDIS
5	ID	NUMBER	5		NOT NULL	Building ID
6	TIER	NUMBER	5		NOT NULL	Tier ID
7	DESCRIPTION	CHAR	80		NULL	Building Description
8	HEIGHT	NUMBER	5	2	NULL	Building Height from Ground Level, Meters
9	ELEVATION	NUMBER	7	2	NULL	Elevation of Base of Building, Feet
10	NPTS	NUMBER	2		NULL	Number of Vertex Point
11	ISDEFAULT	CHAR	2		NULL	Code to indicate Building Data are Default Domain: Table: DEFISDEFAULT

Table BLDGPNTS – Building Point Information
(Primary Key: CO + FACID + AB + DIS + ID + TIER + POINTID)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	CO	NUMBER	2		NOT NULL	County Number Domain: Table COABDIS
2	FACID	NUMBER	9		NOT NULL	Facility ID Domain: Table FACILITY (CO+FACID+AB+DIS)
3	AB	CHAR	3		NOT NULL	Air Basin Domain: Table COABDIS
4	DIS	CHAR	3		NOT NULL	District Domain: Table COABDIS
5	ID	NUMBER	5		NOT NULL	Building ID
6	TIER	NUMBER	5		NOT NULL	Tier ID
7	POINTID	NUMBER	5		NOT NULL	Vertex Point ID
8	PLOTORDER	NUMBER	5		NULL	Plot Order
9	UTME	NUMBER	9	2	NULL	UTM East Offset in Meters, Relative to Facility
10	UTMN	NUMBER	10	2	NULL	UTM North Offset in Meters, Relative to Facility

Table PROP – Property Information
(Primary Key: CO + FACID + AB + DIS + ID)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	CO	NUMBER	2		NOT NULL	County Number
2	FACID	NUMBER	9		NOT NULL	Facility ID
3	AB	CHAR	3		NOT NULL	Air Basin
4	DIS	CHAR	3		NOT NULL	District
5	ID	NUMBER	5		NOT NULL	Property ID
6	DESCRIPTION	CHAR	80		NULL	Property Description
7	NPTS	NUMBER	5		NULL	Number of Vertex Points
8	ISDEFAULT	CHAR	2		NULL	Code to indicate that the Property Information is Default Domain: DEFISDEFAULT

Table PROPPNTS – Property Point Data
(Primary Key: CO + FACID + AB + DIS + ID + POINTID)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	CO	NUMBER	2		NOT NULL	County Number
2	FACID	NUMBER	9		NOT NULL	Facility ID
3	AB	CHAR	3		NOT NULL	Air Basin
4	DIS	CHAR	3		NOT NULL	District
5	ID	NUMBER	5		NOT NULL	Property ID
6	POINTID	NUMBER	5		NOT NULL	Vertex Point ID
7	PLOTORDER	NUMBER	5		NULL	Plot Order
8	UTME	NUMBER	9	2	NULL	UTM East Offset in Meters, Relative to Facility
9	UTMN	NUMBER	10	2	NULL	UTM North Offset in Meters, Relative to Facility
10	ELEVATION	NUMBER	7	2	NULL	Elevation, feet

Table RECEP – Receptor Information
(Primary Key: RECID + CO + AB + DIS + RECGROUP)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	CO	NUMBER	2		NOT NULL	County Number
2	AB	CHAR	3		NOT NULL	Air Basin
3	DIS	CHAR	3		NOT NULL	District
4	RECID	NUMBER	10		NOT NULL	Receptor ID
5	RECGROUP	CHAR	8		NOT NULL	Receptor Group
6	RECNAME	CHAR	50		NULL	Receptor Name
7	RECTYPE	CHAR	8		NULL	Receptor Type
8	POPRES	NUMBER	10		NULL	Residential Population
9	POPWORK	NUMBER	10		NULL	Working Population
10	ELEV	NUMBER	7	2	NULL	Elevation in Feet
11	COORD_SYS	CHAR	3		NULL	Coordinate System Used Domain: DD - Decimal Degrees TA - Teale Albers, meters U10- UTM10, kilometers U11- UTM11, kilometers

Table RECEP – Receptor Information (Cont.)
(Primary Key: RECID + CO + AB + DIS + RECGROUP)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
12	DATUM	CHAR	5		NULL	Type of Datum Used Domain: NAD27 – North American Datum 1927 NAD83 – North American Datum 1983 WGS84 – World Geodetic System 1984
13	SPHEROID	CHAR	10		NULL	Shape Used for Ellipsoidal Earth Domain: Clarke1866 – Clarke 1866 GRS80 – Geodetic Reference System 1980 WGS84 - World Geodetic System 1984 WGS72 - World Geodetic System 1972
14	X_USERCOORD	NUMBER	12	6	NULL	X (East) Coordinate in COORD_SYS Units
15	Y_USERCOORD	NUMBER	13	6	NULL	Y (North) Coordinate in COORD_SYS Units
16	LOC_METH	CHAR	3		NULL	Method of Collecting Data Domain: Table DEFLOCATION
17	UE_NAD83	NUMBER	8	2	NULL	NAD83 UTM East in meters [ARB use] Domain: UTMEAST
18	UN_NAD83	NUMBER	9	2	NULL	NAD83 UTM North in meters [ARB use] Domain: UTMNORTH
19	LAT_NAD83	NUMBER	8	6	NULL	Latitude in decimal degrees, [ARB use]
20	LON_NAD83	NUMBER	9	6	NULL	Longitude in decimal degrees, [ARB use]
21	ARB_LOC_METH	CHAR	3		NULL	Code to indicate the ARB method to determine SLAT_NAD83 and SLON_NAD83 [ARB use] Domain: Table DEFLOCATION
22	X_TA83	NUMBER	8	2	NULL	X (East) Coordinate in Teale Albers, meters [ARB use]
23	Y_TA83	NUMBER	9	2	NULL	Y (North) Coordinate in Teale Albers, meters [ARB use]

SECTION TWO

TRANSACTION TABLES

Table FACTRANS - Facility Transactions
(Primary Key: BATCHID + BTYPE + TDATE + ACTION + CO + FACID + AB + DIS)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	BATCHID	CHAR	8		NOT NULL	Batch ID
2	BTYPE	CHAR	1		NOT NULL	Batch Type: (A)rea or (P)oint
3	TRANS_ID	CHAR	3		NOT NULL	Transaction ID - Domain FAC
4	ACTION	CHAR	1		NOT NULL	Action: (A)dd, (C)hange, or (D)elete
5	CO	NUMBER	2		NOT NULL	County Number
6	FACID	NUMBER	9		NOT NULL	Facility ID
7	AB	CHAR	3		NOT NULL	Air Basin
8	DIS	CHAR	3		NOT NULL	District
9	FNAME	CHAR	60		NULL	Name of Facility at Location
10	FSTREET	CHAR	60		NULL	Street Where Facility Is Located
11	FCITY	CHAR	20		NULL	City Where Facility Is Located
12	FZIP	CHAR	5		NULL	Facility Zip Code
13	FZIPEXT	CHAR	4		NULL	Facility Zip Code Extension
14	PCONTACT	CHAR	24		NULL	Phone Contact Person
15	AREAC	NUMBER	3		NULL	Telephone Area Code
16	PHONE	NUMBER	7		NULL	Telephone Number
17	FSIC	NUMBER	4		NOT NULL	Facility SIC
18	NEMP	NUMBER	5		NULL	Number of Employees
19	MNAME	CHAR	60		NULL	Company Name for Mailing Purpose
20	MSTREET	CHAR	60		NULL	Company Mailing Street
21	MCITY	CHAR	20		NULL	Company Mailing City
22	MSTATE	CHAR	2		NULL	Company Mailing State
23	MZIP	CHAR	5		NULL	Mail Zip Code
24	MZIPEXT	CHAR	4		NULL	Mail Zip Code Extension
25	MCONTACT	CHAR	24		NULL	Mail Contact Person
26	AQCR	NUMBER	2		NULL	EPA Air Quality Control Region
27	FACSUBCO	CHAR	4		NULL	Facility Sub-county Identifier
28	CODESIG	CHAR	1		NULL	Area Designation for CO
29	N02DESIG	CHAR	1		NULL	Area Designation for $N0_2$
30	OZDESIG	CHAR	1		NULL	Area Designation for Ozone
31	PMDESIG	CHAR	1		NULL	Area Designation for Particulate
32	S02DESIG	CHAR	1		NULL	Area Designation for $S0_2$
33	FAC_PHASE	CHAR	2		NULL	Phase Facility Brought into Program
34	FAC_FORECAST	CHAR	1		NULL	Fac. Used for Forecasting Purposes
35	PRIORITY	CHAR	1		NULL	Priority for Risk Assessment
36	INDUSTRYWIDE	CHAR		1		NULL Included in Industry Wide
37	FACD1	CHAR	9		NULL	Reserved for District Use
38	FACD2	CHAR	9		NULL	Reserved for District Use
39	FRS_ID	CHAR	12		NULL	EPA Facility Registry System Identification
40	FNAICS	CHAR	6		NULL	Facility North American Industry Classification
41	COORD_SYS	CHAR	3		NULL	Coordinate System Used
42	DATUM	CHAR5	5		NULL	Type of Datum Used
43	SPHEROID	CHAR	9		NULL	Shape Used for Ellipsoidal Earth
44	X_USERCOORD	NUMBER	12	6	NULL	X Coordinate
45	Y_USERCOORD	NUMBER	13	6	NULL	Y Coordinate
46	LOC_METH	CHAR	3		NULL	Method of Collecting Data
47	SMALL_COMM	CHAR	1		NULL	Is Facility a Small Commercial Facility (i.e., Aggregated Point Source)? Domain: Y/N (May be expanded in future to use codes for specific types.)

Table FACTRANS - Facility Transactions (Cont.)
(Primary Key: BATCHID + BTYPE + TDATE + ACTION + CO + FACID + AB + DIS)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
48	FAC_UPDATE	CHAR	3		NULL	Updating Code
49	CHAPIS	CHAR	1		NULL	CHAPIS Facility
50	FAC_LOC_ONLY	CHAR	1		NULL	Is this Facility Record for a "Location Only" Facility (no site-specific emissions)? Domain: Y/N
51	CERR_CODE	CHAR	1		NULL	Consolidated Emission Reporting Rule Identification Domain: A/B
52	MEMO_FAC	CHAR	80		NULL	Comments on Facility [District option]
53	FACU_D	DATE	8		NULL	Date District Last Updated
54	OPERATOR	CHAR	3		NULL	Operator Initials
55	TDATE	DATE	8		NOT NULL	Transaction Date

Table FAC_RISK_TRANS - Facility Risk Transactions
(Primary Key: BATCHID + BTYPE + TDATE + ACTION + CO + FACID + AB + DIS)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	BATCHID	CHAR	8		NOT NULL	Batch ID
2	BTYPE	CHAR	1		NOT NULL	Batch Type: (A)rea or (P)oint
3	TRANS_ID	CHAR	3		NOT NULL	Transaction ID - Domain RSK
4	ACTION	CHAR	1		NOT NULL	Action: (A)dd, (C)hange, or (D)elete
5	FEE_CAT	CHAR	1		NULL	Toxic Program Status A Prioritization score > 10.0 B HRA >= 10 and less than 50 C HRA >= 50 and less than 100 D HRA >= 100 E Unprioritized (new facility) F HRA >= 1 and less than 10 G Exempt H Exempt, HRA < 1 M Out, de minimus O Out of business P Exempt, prioritization score < 1.0 U District update facility - Prioritization Score greater than 1 and <= 10
6	CO	NUMBER	2		NOT NULL	County Number
7	FACID	NUMBER	9		NOT NULL	Facility ID
8	AB	CHAR	3		NOT NULL	Air Basin
9	DIS	CHAR	3		NOT NULL	District
10	SIC_FEEREG	NUMBER	4		NULL	SIC Code for facility in Fee Regulation
11	EXEMPT	CHAR	50		NULL	Exemption status and reason
12	SMALL_BUS	CHAR	1		NULL	Small business?
13	VINTAGE_RISK	NUMBER	4		NULL	Year of Risk Data
14	VINTAGE_PS	NUMBER	4		NULL	Year of Prioritization Score
15	NUM_SCC	NUMBER	4		NULL	Number of SCC used by facility
16	PROXIMITY	NUMBER	9	2	NULL	Receptor Proximity, meters
17	CANCEREPP	NUMBER	8	2	NULL	Cancer Priority Score, Emissions and Potency Procedure

Table FAC_RISK_TRANS - Facility Risk Transactions (Cont.)
(Primary Key: BATCHID + BTYPE + TDATE + ACTION + CO + FACID + AB + DIS)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
18	NONCANCEREPP	NUMBER	7	2	NULL	Non-cancer Priority Score, Emissions and Potency Procedure
19	ACUTEEPP	NUMBER	7	2	NULL	Acute Priority Score, Emissions and Potency Procedure
20	CHRONICEPP	NUMBER	7	2	NULL	Chronic Priority Score, Emissions and Potency Procedure
21	CANCERDAP	NUMBER	8	2	NULL	Cancer Priority Score, Dispersion Adjustment Procedure
22	NONCANCERDAP	NUMBER	7	2	NULL	Non-cancer Priority Score, Dispersion Adjustment Procedure
23	ACUTEDAP	NUMBER	7	2	NULL	Acute Priority Score, Dispersion Adjustment Procedure
24	CHRONICDAP	NUMBER	7	2	NULL	Chronic Priority Score, Dispersion Adjustment Procedure
25	TS	NUMBER	8	2	NULL	Overall Priority Score
26	PRIORITY_MULT	NUMBER	6	2	NULL	Priority Multiplier
27	HRA_CAN	NUMBER	7	2	NULL	Health Risk Assessment Cancer Risk
28	CHRONIC_HI	NUMBER	7	2	NULL	Chronic Hazard Index
29	ACUTE_HI	NUMBER	7	2	NULL	Acute Hazard Index
30	OPERATOR	CHAR	3		NULL	Operator Initials
31	TDATE	DATE	8		NOT NULL	Transaction Date

Table STKTRANS - Stack Transactions
(Primary Key: BATCHID + BTYPE + TDATE + ACTION + CO + FACID + AB + DIS + STK)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	BATCHID	CHAR	8		NOT NULL	Batch ID
2	BTYPE	CHAR	1		NOT NULL	Batch Type: (A)rea or (P)oint
3	TRANS_ID	CHAR	3		NOT NULL	Transaction ID - Domain STK
4	ACTION	CHAR	1		NOT NULL	Action: (A)dd, (C)hange, or (D)elete
5	CO	NUMBER	2		NOT NULL	County Number
6	FACID	NUMBER	9		NOT NULL	Facility ID
7	AB	CHAR	3		NOT NULL	Air Basin
8	DIS	CHAR	3		NOT NULL	District
9	STK	NUMBER	6		NOT NULL	Stack ID
10	STKHT	NUMBER	8	4	NULL	Stack Height (Feet)
11	STKDIAM	NUMBER	4	1	NULL	Stack Diameter at Exit(feet)
12	GT	NUMBER	5	1	NULL	Actual Gas Temp at Exit (Deg F)
13	GF	NUMBER	10	2	NULL	Actual Gas Flow (CFM)
14	GV	NUMBER	8	2	NULL	Actual Gas Velocity at Exit (Ft/min)
15	STKNAME	CHAR	60		NULL	Stack Name
16	COORD_SYS	CHAR	15		NULL	Coordinate System Used
17	DATUM	CHAR	5		NULL	Type of Datum Used
18	SPHEROID	CHAR	10		NULL	Shape Used for Ellipsoidal Earth
19	X_USERCOORD	NUMBER	12	6	NULL	X Coordinate
20	Y_USERCOORD	NUMBER	13	6	NULL	Y Coordinate
21	LOC_METH	CHAR	3		NULL	Method of Collecting Data
22	ELEV	NUMBER	7	2	NULL	Elevation in Feet

Table STKTRANS - Stack Transactions (Cont.)
(Primary Key: BATCHID + BTYPE + TDATE + ACTION + CO + FACID + AB + DIS + STK)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
23	SRCTYP	CHAR	7		NOT NULL	Type of Release as specified for ISC
24	SYINIT	NUMBER	7	2	NULL	Initial Lateral Dimension of Volume Release, feet
25	SZINIT	NUMBER	7	2	NULL	Initial Vertical Dimension of Volume or Area Release (Optional for Area), feet
26	XINIT	NUMBER	7	2	NULL	Square Length or Rec. Side of Area Release, feet
27	YINIT	NUMBER	7	2	NULL	Rectangular Side of Area or Open Pit Release (Optional for Area), feet
28	ANGLE	NUMBER	5	2	NULL	Angle of Area or Open Pit Source, degree (Optional)
29	PITVOL	NUMBER	15	2	NULL	Volume of Open Pit Source, ft^3
30	ISDEFAULT	CHAR	2		NULL	Code to indicate Stack Data are default
31	MEMO_STK	CHAR	80		NULL	Comments on Stack Information
32	STKU_D	DATE	8		NULL	Date Stack Last Updated
33	OPERATOR	CHAR	3		NULL	Operator Initials
34	TDATE	DATE	8		NOT NULL	Transaction Date

Table DEVTRANS - Device Transactions
(Primary Key: BATCHID + BTYPE + TDATE + ACTION + CO + FACID + AB + DIS + DEV)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	BATCHID	CHAR	8		NOT NULL	Batch ID
2	BTYPE	CHAR	1		NOT NULL	Batch Type: (A)rea or (P)oint
3	TRANS_ID	CHAR	3		NOT NULL	Transaction ID - Domain: DEV
4	ACTION	CHAR	1		NOT NULL	Action: (A)dd, (C)hange, or (D)elete
5	CO	NUMBER	2		NOT NULL	County Number
6	FACID	NUMBER	9		NOT NULL	Facility ID
7	AB	CHAR	3		NOT NULL	Air Basin
8	DIS	CHAR	3		NOT NULL	District
9	DEV	NUMBER	6		NOT NULL	Device ID
10	DEVNM	CHAR	40		NULL	Local Name of this Device
11	PERID	CHAR	32		NULL	Local Permit ID
12	NUMDEV	NUMBER	5		NULL	Number of Devices Represented
13	EQSIZE	NUMBER	7	1	NULL	Equipment Size
14	EQSIZE_CF	CHAR	1		NULL	Equipment Size Confidential Flag
15	EQUNITC	NUMBER	5		NULL	Equipment Size Units Code
16	DEVSUBCO	CHAR	4		NULL	Sub-county Indicator
17	EQTYPEC	NUMBER	5		NULL	Equipment Type Code
18	SECT	NUMBER	2		NULL	Section
19	TWNSHP	NUMBER	2		NULL	Township
20	TWNSHPB	CHAR	1		NULL	Township Base
21	RANGE	NUMBER	2		NULL	Range
22	RANGEB	CHAR	1		NULL	Range Base
23	DEVD1	CHAR	40		NULL	Reserved for District Use
24	DEVD2	CHAR	40		NULL	Reserved for District Use
25	DEVCAP	NUMBER	6	2	NULL	Device Output Capacity
26	MEMO_DEV	CHAR	80		NULL	Comments on Device Information [District option]
27	DEVU_D	DATE	8		NULL	Date District Last Updated
28	OPERATOR	CHAR	3		NULL	Operator Initials
29	TDATE	DATE	8		NOT NULL	Transaction Date

Table PROTRANS - Process Transactions
(Primary Key: BATCHID + BTYPE + TDATE + ACTION + CO + FACID + AB + DIS + DEV + PROID)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	BATCHID	CHAR	8		NOT NULL	Batch ID
2	BTYPE	CHAR	1		NOT NULL	Batch Type: (A)rea or (P)oint
3	TRANS_ID	CHAR	3		NOT NULL	Transaction ID - Domain PRO
4	ACTION	CHAR	1		NOT NULL	Action: (A)dd, (C)hange, or (D)elete
5	CO	NUMBER	2		NOT NULL	County Number
6	FACID	NUMBER	9		NOT NULL	Facility ID
7	AB	CHAR	3		NOT NULL	Air Basin
8	DIS	CHAR	3		NOT NULL	District
9	DEV	NUMBER	6		NOT NULL	Device ID
10	PROID	NUMBER	14		NOT NULL	Process ID
11	PRDESC	CHAR	60		NULL	Process Description
12	SCC	NUMBER	14		NOT NULL	SCC or EIC
13	SIC	NUMBER	14		NULL	Standard Indust. Class or EIC[3]
14	PR	NUMBER	11		NULL	Process Rate in SCC Units
15	PRUNITS	NUMBER	4		NULL	Process Rate Unit Code
16	UPR	NUMBER	12	1	NULL	Unreconciled Process Rate
17	MAXHR_PR	NUMBER	9		NULL	Maximum Hourly Process Rate
18	MAXD	NUMBER	9	3	NULL	Maximum Design Rate
19	S	NUMBER	3	2	NULL	Percent Fuel Sulfur Content
20	PRORIG	NUMBER	3		NULL	Process Rate Origin Code
21	PRREL	NUMBER	3		NULL	Process Rate Reliability
22	STK	NUMBER	6		NULL	Stack ID
23	HPDY	NUMBER	2		NULL	Operating Hours per Day Daily
24	DPWK	NUMBER	2		NULL	Operating Days per Week
25	WPYR	NUMBER	2		NULL	Operating Weeks per Year
26	YREST	NUMBER	4		NULL	Year of Process/Emission Estimate Made
27	PROD1	CHAR	40		NULL	Reserved for District Use
28	PROD2	CHAR	40		NULL	Reserved for District Use
29	PR_FORECAST	CHAR	1		NULL	Process Specific Forecast Indicator
30	CONF	CHAR	1		NULL	Confidential Process Data
31	JANT	NUMBER	4	1	NULL	Percent Activity for January
32	FEBT	NUMBER	4	1	NULL	Percent Activity for February
33	MART	NUMBER	4	1	NULL	Percent Activity for March
34	APRT	NUMBER	4	1	NULL	Percent Activity for April
35	MAYT	NUMBER	4	1	NULL	Percent Activity for May
36	JUNT	NUMBER	4	1	NULL	Percent Activity for June
37	JULT	NUMBER	4	1	NULL	Percent Activity for July
38	AUGT	NUMBER	4	1	NULL	Percent Activity for August
39	SEPT	NUMBER	4	1	NULL	Percent Activity for Sept.
40	OCTT	NUMBER	4	1	NULL	Percent Activity for October
41	NOVT	NUMBER	4	1	NULL	Percent Activity for November
42	DECT	NUMBER	4	1	NULL	Percent Activity for Dec.
43	SPATIAL	CHAR	8		NULL	Spatial Distribution Parameter
44	SEST	CHAR	6		NULL	Agency Making Area Estimate
45	PRUP	DATE	8		NULL	Date of Last Process Rate Update
46	NAICS	CHAR	6		NULL	NAICS Code
47	OUTPUT	NUMBER	8	2	NULL	Process Rate Output in MegaWatt
48	MEMO_PR	CHAR	80		NULL	Process Information Memo [District option]
49	ISDEFAULT	CHAR	2		NULL	Code to indicate the link to the StackID is default.
50	OPERATOR	CHAR	10		NULL	Operator Initials
51	TDATE	DATE	8		NOT NULL	Transaction Date

Table EMSTRANS - Emission Transactions
(Primary Key: BATCHID + BTYPE + TDATE + ACTION + CO + FACID + AB + DIS + DEV + PROID + POL)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	BATCHID	CHAR	8		NOT NULL	Batch ID
2	BTYPE	CHAR	1		NOT NULL	Batch Type: (A)rea or (P)oint
3	TRANS_ID	CHAR	3		NOT NULL	Transaction ID - Domain EMS
4	ACTION	CHAR	1		NOT NULL	Action: (A)dd, (C)hange, or (D)elete
5	CO	NUMBER	2		NOT NULL	County Number
6	FACID	NUMBER	9		NOT NULL	Facility ID
7	AB	CHAR	3		NOT NULL	Air Basin
8	DIS	CHAR	3		NOT NULL	Distirct
9	DEV	NUMBER	6		NOT NULL	Device ID
10	PROID	NUMBER	14		NOT NULL	Process ID
11	POL	NUMBER	9		NOT NULL	Pollutant Code
12	UEMFACT	NUMBER	10		NULL	Uncontrolled Emission Factor
13	CNTL1	NUMBER	3		NULL	Primary Pol. Control Device Code
14	CNTL2	NUMBER	3		NULL	Secondary Pol. Control Device Code
15	CNTLEFF	NUMBER	4	1	NULL	Control Efficiency (Percent)
16	EMFACT	NUMBER	10		NULL	Emission Factor (Lbs/SCC Units)
17	EMORIG	NUMBER	3		NULL	Emission Factor Origin Code
18	EMREL	NUMBER	3		NULL	Emission Factor Reliability
19	EMS	NUMBER			NOT NULL	Annual Emissions
20	HRMAXEMS	NUMBER			NULL	Maximum Hourly Emissions
21	METH	NUMBER	2		NULL	Emission Calculation Method Code
22	REASCH	NUMBER	2		NULL	Reason Emission Changed Code
23	EXEMS	NUMBER			NULL	Total Excess Emissions
24	UNREMS	NUMBER	9	1	NULL	Unreconciled Emissions (Tons/year)
25	POTENTIAL	NUMBER			NULL	Potential Emissions for Districts' Use
26	EMS_FORECAST	CHAR	1		NULL	Pollutant Specific Forecast Indicators
27	EMSUP	DATE	8		NULL	Date of Last EMS Update by District
28	MAINTAINED	CHAR	1		NULL	Flag to Indicate Whether the Emissions of this Pollutant are agreed to be regularly maintained by the District
29	MEMO_EMS	CHAR	80		NULL	Comments on Emission Information [District option]
30	OPERATOR	CHAR	3		NULL	Operator Initials
31	TDATE	DATE	8		NOT NULL	Transaction Date

Table EXCTRANS - Excess Emission Transactions
(Primary Key: BATCHID + BTYPE + TDATE + ACTION + CO + FACID + AB + DIS + DEV + PROID + POL + EXTYPE +EXQTR + EXYR)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	BATCHID	CHAR	8		NOT NULL	Batch ID
2	BTYPE	CHAR	1		NOT NULL	Batch Type: (A)rea or (P)oint
3	TRANSID	CHAR	3		NOT NULL	Transaction ID
4	ACTION	CHAR	1		NOT NULL	Action: (A)dd, (C)hange, or D)elete
5	CO	NUMBER	2		NOT NULL	County Number
6	FACID	NUMBER	9		NOT NULL	Facility ID
7	AB	CHAR	3		NOT NULL	Air Basin
8	DIS	CHAR	3		NOT NULL	District
9	DEV	NUMBER	6		NOT NULL	Device ID

Table EXCTRANS - Excess Emission Transactions (Cont.)
(Primary Key: BATCHID + BTYPE + TDATE + ACTION + CO + FACID + AB + DIS + DEV + PROID + POL + EXTYPE +EXQTR + EXYR)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
10	PROID	NUMBER			NOT NULL	Process ID
11	POL	NUMBER	9		NOT NULL	Pollutant
12	EXTYPE	NUMBER	3		NOT NULL	Type of Excess Emissions Code
13	EXQTR	NUMBER	1		NOT NULL	Quarter of Year of Excess Emissions
14	EXYR	NUMBER	4		NOT NULL	Calendar Year of Excess Emissions
15	EXCESS	NUMBER			NOT NULL	Excess Emissions
16	OPERATOR	CHAR	3		NULL	Operator Initials
17	TDATE	DATE	8		NOT NULL	Transaction Date

Table SUPTRANS - Supplemental Uses and Production Transaction
(Primary Key: CO + FACID + AB + DIS + POL)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	BATCHID	CHAR	8		NOT NULL	Batch ID
2	BTYPE	CHAR	1		NOT NULL	Batchtype: (A)rea or (P)oint
3	TRANS_ID	CHAR	3		NOT NULL	Transaction ID - Domain SUP
4	ACTION	CHAR	1		NOT NULL	Action: (A)dd, (C)hange, or (D)elete
5	CO	NUMBER	2		NOT NULL	County Number
6	FACID	NUMBER	9		NOT NULL	Facility ID
7	AB	CHAR	3		NOT NULL	Air Basin
8	DIS	CHAR	3		NOT NULL	District
9	POL	NUMBER	9		NOT NULL	Pollutant ID
10	USED	CHAR	1		NULL	Is this Substance Used?
11	PRODUCED	CHAR	1		NULL	Is this Substance Produced?
12	PRESENT	CHAR	1		NULL	Is this Subst. Otherwise Present?
13	HOW_PRESENT	CHAR	39		NULL	How Substances Is Otherwise Present?
14	OPERATOR	CHAR	3		NULL	Operator Initials
15	TDATE	DATE	8		NOT NULL	Transaction Date

Table BLDGTRANS – Building Transaction
(Primary Key: BATCHID + TRANSID + ACTION + CO + FACID + AB + DIS + ID + TIER)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	BATCHID	CHAR	8		NOT NULL	Batch ID
2	BTYPE	CHAR	1		NOT NULL	Batch Type: (P)oint
3	TRANS_ID	CHAR	3		NOT NULL	Transaction ID - Domain: BLD
4	ACTION	CHAR	1		NOT NULL	Action: A(dd), C(hange), or D(elete)
5	CO	NUMBER	2		NOT NULL	County Number
6	FACID	NUMBER	9		NOT NULL	Facility ID
7	AB	CHAR	3		NOT NULL	Air Basin
8	DIS	CHAR	3		NOT NULL	District
9	ID	NUMBER	5		NOT NULL	Building ID
10	TIER	NUMBER	5		NOT NULL	Tier ID
11	DESCRIPTION	CHAR	80		NULL	Building Description
12	HEIGHT	NUMBER	5	2	NULL	Building Height from Ground Level, Meters

Table BLDGTRANS – Building Transaction (Cont.)
(Primary Key: BATCHID + TRANSID + ACTION + CO + FACID + AB + DIS + ID + TIER)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
13	ELEVATION	NUMBER	7	2	NULL	Elevation of Base of Building, Feet
14	NPTS	NUMBER	2		NULL	Number of Vertex Point
15	ISDEFAULT	CHAR	2		NULL	Code to indicate Building Data are Default
16	OPERATOR	CHAR	3		NULL	Operator Initials
17	TDATE	DATE	8		NOT NULL	Transaction Date

Table BLDGPTRANS – Building Point Transaction
(Primary Key: BATCHID + BTYPE + TRANS_ID + CO + FACID + AB + DIS + ID + TIER + POINTID)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	BATCHID	CHAR	8		NOT NULL	Batch ID
2	BTYPE	CHAR	1		NOT NULL	Batch Type: (P)oint
3	TRANS_ID	CHAR	3		NOT NULL	Transaction ID - Domain: BLP
4	ACTION	CHAR	1		NOT NULL	Action: (A)dd, (C)hange, or (D)elete
5	CO	NUMBER	2		NOT NULL	County Number
6	FACID	NUMBER	9		NOT NULL	Facility ID
7	AB	CHAR	3		NOT NULL	Air Basin
8	DIS	CHAR	3		NOT NULL	District
9	ID	NUMBER	5		NOT NULL	Building ID
10	TIER	NUMBER	5		NOT NULL	Tier ID
11	POINTID	NUMBER	5		NOT NULL	Vertex Point ID
12	PLOTORDER	NUMBER	5		NULL	Plot Order
13	UTME	NUMBER	9	2	NULL	UTM East Offset in Meters, Relative to Facility
14	UTMN	NUMBER	9	2	NULL	UTM North Offset in Meters, Relative to Facility
15	OPERATOR	CHAR	3		NULL	Operator Initials
16	TDATE	DATE	8		NOT NULL	Transaction Date

Table PROPTRANS – Property Transaction
(Primary Key: BATCHID + BTYPE + TRANS_ID + CO + FACID + AB + DIS + ID)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	BATCHID	CHAR	8		NOT NULL	Batch ID
2	BTYPE	CHAR	1		NOT NULL	Batch Type: (P)oint
3	TRANS_ID	CHAR	3		NOT NULL	Transaction ID - Domain PRT
4	ACTION	CHAR	1		NOT NULL	Action: A(dd), (C)hange, or (D)elete
5	CO	NUMBER	2		NOT NULL	County Number
6	FACID	NUMBER	9		NOT NULL	Facility ID
7	AB	CHAR	3		NOT NULL	Air Basin
8	DIS	CHAR	3		NOT NULL	District
9	ID	NUMBER	5		NOT NULL	Property ID
10	DESCRIPTION	CHAR	80		NULL	Property Description
11	NPTS	NUMBER	5		NULL	Number of Vertex Points
12	ISDEFAULT	CHAR	2		NULL	Is the Property Information Defaulted
13	OPERATOR	CHAR	3		NULL	Operator Initials
14	TDATE	DATE	8		NOT NULL	Transaction Date

Table PROPPTRANS – Property Point Data Transaction
(Primary Key: BATCHID + BTYPE + TRANS_ID + CO + FACID + AB + DIS + ID + POINTID)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	BATCHID	CHAR	8		NOT NULL	Batch ID
2	BTYPE	CHAR	1		NOT NULL	Batch Type: (P)oint
3	TRANS_ID	CHAR	3		NOT NULL	Transaction ID - Domain PRP
4	ACTION	CHAR	1		NOT NULL	Action: A(dd), C(hange), or D(elete)
4	CO	NUMBER	2		NOT NULL	County Number
5	FACID	NUMBER	9		NOT NULL	Facility ID
6	AB	CHAR	3		NOT NULL	Air Basin
7	DIS	CHAR	3		NOT NULL	District
8	ID	NUMBER	5		NOT NULL	Property ID
9	POINTID	NUMBER	5		NOT NULL	Vertex Point ID
10	PLOTORDER	NUMBER	5		NULL	Plot Order
11	UTME	NUMBER	9	2	NULL	UTM East Offset in Meters, Relative to Facility
12	UTMN	NUMBER	9	2	NULL	UTM North Offset in Meters, Relative to Facility
13	ELEVATION	NUMBER	7	2	NULL	Elevation, feet
15	OPERATOR	CHAR	3		NULL	Operator Initials
16	TDATE	DATE	8		NOT NULL	Transaction Date

Table RECEPTRANS – Receptor Transaction
(Primary Key: BATCHID + BTYPE + TRANS_ID + RECID + CO + AB + DIS + RECGROUP)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	BATCHID	CHAR	8		NOT NULL	Batch ID
2	BTYPE	CHAR	1		NOT NULL	Batch Type: (P)oint
3	TRANS_ID	CHAR	3		NOT NULL	Transaction ID - Domain RCP
4	ACTION	CHAR	1		NOT NULL	Action: A(dd), C(hange), or D(elete)
5	CO	NUMBER	2		NOT NULL	County Number
6	AB	CHAR	3		NOT NULL	Air Basin
7	DIS	CHAR	3		NOT NULL	District
8	RECID	NUMBER	10		NOT NULL	Receptor ID
9	RECGROUP	CHAR	8		NOT NULL	Receptor Group
10	RECNAME	CHAR	50		NULL	Receptor Name
11	RECTYPE	CHAR	8		NULL	Receptor Type
12	POPRES	NUMBER	6		NULL	Resident Population
13	POPWORK	NUMBER	6		NULL	Worker Population
14	ELEV	NUMBER	7	2	NULL	Elevation in feet
15	COORD_SYS	CHAR	3		NULL	Coordinate System Used Domain: DD - Decimal Degrees TA - Teale Albers, meters U10- UTM10, kilometers U11- UTM11, kilometers
16	DATUM	CHAR	5		NULL	Type of Datum Used Domain: NAD27 – North American Datum 1927 NAD83 – North American Datum 1983 WGS84 – World Geodetic System 1984

Table RECEPTRANS – Receptor Transaction (Cont.)
(Primary Key: BATCHID + BTYPE + TRANS_ID + RECID + CO + AB + DIS + RECGROUP)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
17	SPHEROID	CHAR	10		NULL	Shape Used for Ellipsoidal Earth Domain: Clarke1866 – Clarke 1886 GRS80 – Geodetic Reference System 1980 WGS84 - World Geodetic System 1984 WGS72 - World Geodetic System 1972
18	X_USERCOORD	NUMBER	12	6	NULL	X (East) Coordinate in COORD_SYS Units
19	Y_USERCOORD	NUMBER	13	6	NULL	Y (North) Coordinate in COORD_SYS Units
20	LOC_METH	CHAR	3		NULL	Method of Collecting Data Domain: Table DEFLOCATION
24	OPERATOR	CHAR	3		NULL	Operator Initials
25	TDATE	DATE	8		NOT NULL	Transaction Date

SECTION THREE

INTERNAL UTILITY TABLES

Table BPRLOG - Batch Processing Log
(Primary Key: BATCHID + REC_NUM)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	BATCHID	CHAR	8		NOT NULL	Batch ID
2	REC_NUM	NUMBER	7		NOT NULL	Record Number
3	MESG	CHAR	80		NULL	Processing Message
4	PRDATE	DATE	8		NULL	Processing Date

Table CATEGORY - Category Information
(Primary Key: SCC + SIC)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	SCC	NUMBER	14		NOT NULL	SCC or EIC Code Domain: Table SCC
2	SIC	NUMBER	14		NOT NULL	SIC Code or EIC Code Domain: Table SIC
3	NAICS	CHAR	6		NULL	NAICS Code Domain: Table NAICS
4	EIC	NUMBER	14		NULL	Complete Emission Inv. Code Domain: Table EIC
5	REIC	NUMBER	14		NULL	EIC for Reconciliation Purposes Domain: Table EIC
6	CES	NUMBER	6		NULL	Category of Emission Source Range: 1 - 84000
7	CATU	DATE	8		NULL	Date and Time of Last Update
8	TYPE	CHAR	2		NULL	Source Type Domain: SP - Stationary Point SA - Stationary Aggregated A - Area-wide M - On-road Mobile O - Other Mobile N - Natural (Non-anthropogenic)

Table CNTLDEV - Pollution Control Device Codes And Names
(Primary Key: CNTL)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	CNTL	NUMBER	3		NOT NULL	Pollution Control Device Code Range: 0-999
2	CNTLN	CHAR	80		NULL	Pollution Control Device Name
3	CNTLDESC	CHAR	80		NULL	Pollution Control Dev. Description

Table CNTLEFF - Pollution Control Device Efficiency Ranges
(Primary Key: CNTL + POL)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	CNTL	NUMBER	3		NOT NULL	Pollution Control Device Code Range: 0 - 999
2	CNTLEFFGRP	CHAR	4		NOT NULL	Control Efficiency Group Domain Table DEFCNTLEFFGRP
2	POL	NUMBER	9		NOT NULL	Pollutant Code Domain Table POLLUTANT
3	MINEFF	NUMBER	5	1	NULL	Minimum Control Effeciency Range: -100.0 - 100.0
4	MAXEFF	NUMBER	5	1	NULL	Maximum Control Efficiency Range: -100.0 - 100.0

Table COABDIS - County, Air Basin, and District Information
(Primary Key: CO + AB + DIS)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	CO	NUMBER	2		NOT NULL	County Number Range: 1- 58
2	AB	CHAR	3		NOT NULL	Air Basin ID
3	DIS	CHAR	3		NOT NULL	District ID
4	MERGE_YEAR	NUMBER	4		NULL	Merged Year – Starting Year Data are Merged
5	ABN	CHAR	30		NOT NULL	Air Basin Name
6	CON	CHAR	15		NOT NULL	County Name
7	COID	CHAR	3		NOT NULL	Alpha County ID
8	DISN	CHAR	35		NOT NULL	District Name

Table EICMETH – EIC Methodology
(Primary Key: EIC + DIS)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	EIC	NUMBER	14		NOT NULL	Emission Inventory Code
2	DIS	CHAR	3		NOT NULL	District ID
3	URL	CHAR	120		NULL	Universal Resource Locator to locate the Method

Table FRACTION - Fraction Information
(Primary Key: SCC + YEAR + AB + CO + DIS)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	SCC	NUMBER	14		NOT NULL	SCC or EIC Code Domain: Table SCC
2	YEAR	NUM	4		NOT NULL	Four Digit Year
3	AB	CHAR	3		NOT NULL	Air Basin ID Domain: Table COABDIS
4	CO	NUM	2		NOT NULL	County ID Domain: Table COABDIS

Table FRACTION - Fraction Information (Cont.)
(Primary Key: SCC + YEAR + AB + CO + DIS)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
5	DIS	CHAR	3		NOT NULL	District ID Domain: Table COABDIS
6	PMPROF	NUMBER	5		NULL	Particulate Matter Profile Code Domain: Table PMPROFILE
7	FRPM2_5	NUMBER	5	4	NULL	Fraction Particulate LE 2.5 Microns Range: 0 - 1.0000
8	FRPM10	NUMBER	5	4	NULL	Fraction Particulate LE 10 Microns Range: 0- 1.0000
9	ORGPROF	NUMBER	5		NULL	Organic Profile Code Domain: Table ORGPROFILE
10	FROG	NUMBER	5	4	NULL	Fraction Reactive Organic Gas Range: 0- 1.0000
11	FRVOC	NUMBER	5	4	NULL	Fraction Volatile Organic Compounds Range: 0- 1.0000
12	PMPROFU	DATE	8		NULL	Date and Time of Last PM Profile Update
13	ORGPROFU	DATE	8		NULL	Date and Time of Last Organic Profile Update
14	FRACU	DATE	8		NULL	Data and Time of Last ARB Fractions Update

Table MV_SEASON_EMS - Motor Vehicle Seasonal Emissions
(Primary Key: YEAR + SEASON + CO + AB + DIS + PROID + POL)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	YEAR	NUMBER	4		NOT NULL	Inventory Year
2	SEASON	CHAR	1		NOT NULL	Season Domain: S - Summer W - Winter
3	CO	NUMBER	2		NOT NULL	County Number Domain: Table COABDIS
4	AB	CHAR	3		NOT NULL	Air Basin Domain: Table COABDIS
5	DIS	CHAR	3		NOT NULL	District Domain: Table COABDIS
6	PROID	NUMBER	14		NOT NULL	Process ID
7	PR	NUMBER			NULL	Process Rate
8	POL	NUMBER	9		NOT NULL	Pollutant Code Domain: Table POLLUTANT
9	EMFACT	NUMBER			NULL	Emission Factor (lbs/SCC Units)
10	ARBFR1	NUMBER	5	4	NULL	Defaulted ROG or PM10 or NOX Frac
11	ARBFR2	NUMBER	5	4	NULL	Defaulted VOC or PM2.5 Fraction
12	EMS	NUMBER			NOT NULL	Seasonal Daily Emissions
13	MV_EMSU	DATE			NULL	Date and Time of Last Update

Table ORGPROFILE - Organic Gas Profile Data and Names
(Primary Key: ORGPROF + SAROAD)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	ORGPROF	NUMBER	5		NOT NULL	Organic Profile Code Range: 0 - 99999
2	SAROAD	NUMBER	5		NOT NULL	Saroad Chemical Code Domain: Table POLLUTANT
3	ORGFRAC	NUMBER	5	4	NULL	Organic Weight Fraction Profiles Range: 0- 1.0000
4	ORGPROFN	CHAR	72		NULL	Organic Profile Name
5	TOGTHC	NUMBER	1		NULL	TOG or THC Domain: 0 - TOG 1 - THC

Table OXFRAC - Oxide Fractions
(Primary Key: ORGPROF)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	ORGPROF	NUMBER	5		NOT NULL	Organic Profile Code Domain: Table ORGPROFILE
2	NOXNO	NUMBER	3	2	NULL	NO_x to NO Fraction Range: 0- 1.00
3	NOXN02	NUMBER	3	2	NULL	NO_x to $N0_2$ Fraction
4	SOXS02	NUMBER	3	2	NULL	SO_X TO $S0_2$ Fraction Range: 0- 1.00
5	SOXS03	NUMBER	3	2	NULL	SO_X TO $S0_3$ Fraction Range: 0- 1.00

Table PMCHEMPROFILE - PM Chemical Weight Fractions by Size
(Primary Key: PMPROF + SAROAD)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	PMPROF	NUMBER	5		NOT NULL	Particulate Matter Profile Code Domain: Table PMPROFILE
2	SAROAD	NUMBER	5		NOT NULL	SAROAD Code Domain: Table POLLUTANT\
3	SPECIES	CHAR	6		NULL	Chemical Species
4	CFLT1	NUMBER	7	6	NULL	Chem. Weight Frac. PM < 1 Micron Range: 0- 1.000000
5	CF1_2NHF	NUMBER	7	6	NULL	Chem. Weight Frac. PM 1 -2.5 Micron Range: 0- 1.000000
6	CFLT2NHF	NUMBER	7	6	NULL	Chem. Weight Frac. PM < 2.5 Micro Range: 0- 1.000000
7	CF2NHF_10	NUMBER	7	6	NULL	Chem. Weight Frac. PM 2.5 - 10 Micron Range: 0- 1.000000
8	CFLT10	NUMBER	7	6	NULL	Chem. Weight Frac. PM < 10 Micron Range: 0- 1.000000
9	CFGT10	NUMBER	7	6	NULL	Chem. Weight Frac. PM > 10 Micron Range: 0- 1.000000
10	CFTOTAL	NUMBER	7	6	NULL	Total Chemical Weight Fraction Range: 0- 1.000000

Table PMSIZEPROFILE - Particulate Matter Profile Codes and Names
(Primary Key: PMPROF)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	PMPROF	NUMBER	5		NOT NULL	Particulate Matter Profile Code Range: 0 - 9999
2	PMPROFN	CHAR	30		NULL	Particulate Matter Profile Name
3	PMLT1	NUMBER	5	4	NULL	Weight Fraction PM <1 Micron Range: 0- 1.0000
4	PM1_2NHF	NUMBER	5	4	NULL	Weight Frac. PM 1 - 2.5 Micron Range: 0- 1.0000
5	PMLT2NHF	NUMBER	5	4	NULL	Weight Frac. PM <2.5 Micron Range: 0- 1.0000
6	PM2NHF_10	NUMBER	5	4	NULL	Weight Frac. PM 2.5 - 10 Micron Range: 0- 1.0000
7	PMLT10	NUMBER	5	4	NULL	Weight Frac. PM < 10 Micron Range: 0- 1.0000
8	PMGT10	NUMBER	5	4	NULL	Weight Frac. PM >10 Micron Range: 0- 1.0000

Table POLLUTANT - Pollutant Information
(Primary Key: POL)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	POL	NUMBER	9		NOT NULL	Pollutant ID Ranges: 1 - 9999 ARB ID Number > 9999 CAS Number SAROAD Code for Criteria Pollutants
2	POL_TYPE	CHAR	1		NULL	Pollutant Type - Domain: C - Criteria T - Toxics
3	POLN	CHAR	80		NULL	Pollutant Full Name
4	POLABBREV	CHAR	15		NULL	Pollutant Abbreviated Name
5	POLALTN1	CHAR	80		NULL	Alternate Name for Pollutant
6	POLALTN2	CHAR	80		NULL	Alternate Name for Pollutant
7	RPT_GROUP	CHAR	80		NULL	Pol'ts Reported by Regulatory Group
8	RPT_ALPHA	CHAR	80		NULL	Pol'ts Rpt'd by Alpha Within Reg. Group
9	ALPHA_POL	CHAR	80		NULL	Pollutants Reported by Alpha
10	HAPS	CHAR	1		NULL	Federal Hazardous Air Pollutant Domain: Y - HAPS
11	REG_SUBST	CHAR	1		NULL	Regulation Substance Indicator Domain: Y - Yes
12	SELECTED_GRP	NUMBER	2		NULL	Selected Group of Substance Code for Report Domain: Table DEFGROUP
13	FORMULA	CHAR	25		NULL	Molecular Formula
14	SAROAD	NUMBER	5		NULL	SAROAD Code Range: 10000 - 45000
15	IUPAC	CHAR	80		NULL	IUPAC Name
16	ADD_DATE	DATE	8		NULL	Date Added to "Hot Spots" List
17	DROP_DATE	DATE	8		NULL	Date Dropped from "Hot Spots" List
18	CHANGE_DATE	DATE	8		NULL	Date Changed on "Hot Spots" List
19	DELETED	CHAR	1		NULL	Subst Deleted from "Hot Spots" List Domain: Y - Yes; N - No

Table POLLUTANT - Pollutant Information (Cont.)
(Primary Key: POL)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
20	FEECAT	NUMBER	2		NULL	Fee Category List Domain: 1 or 2
21	TOXAPPEN	CHAR	5		NULL	Regulation Appendix List Domain: A-I or A-II or A-III
22	BIOCIDE	CHAR	1		NULL	Is Substance a Biocide? Domain: Y - Yes; N - No
23	PHARM	CHAR	1		NULL	Is Substance a Pharmaceutical? Domain: Y - Yes; N - No
24	CARCIN	CHAR	1		NULL	Is Substance a Carcinogen? Domain: Y - Yes; N - No
25	DEG_ACC	NUMBER			NULL	Degree of Accuracy of Substance
26	MOLE_WT	NUMBER	7	2	NULL	Molecular Weight
27	MELT_PT	NUMBER	7	2	NULL	Melting Point (Centigrade)
28	BOIL_PT	NUMBER	7	2	NULL	Boiling Point (Centigrade)
29	AUTOIG	NUMBER	7	2	NULL	Auto Ignition Point (Centigrade)
30	SUBLI	NUMBER	7	2	NULL	Sublimation Point (Centigrade)
31	SPECG	NUMBER	6	4	NULL	Specific Gravity
32	VAPOR	NUMBER	15	9	NULL	Vapor Pressure (mm Hg)
33	VPTEMP	NUMBER	7	2	NULL	Vapor Pres Ref Temp (Centigrade)
34	CHEMSTATE	CHAR	2		NULL	Chemical State Domain: G - Gas; GL - Gas/liquid L - Liquid; LS- Liquid/solid S - Solid
35	DENSITY	NUMBER	9	4	NULL	Density of Substance (Lbs/Cu.ft)
36	CHAPIS_POL	CHAR	1		NULL	Flag to Indicate Whether This Pollutant is used for CHAPIS Domain: Y/N

Table REACT - Substance Reactivity Descriptions
(Primary Key: DMS)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	DMS	CHAR	8		NOT NULL	Detailed Model Species Code
2	OGID	CHAR	8		NULL	Organic Gas ID
3	MIR	NUMBER	6	4	NULL	Maximum Incremental Reactivity (gm 0_3/gm ROG) RANGE: O - 99.9999
4	MOR	NUMBER	6	4	NULL	Maximum Ozone Reactivity (gm 0_3/gm ROG) Range: 0 - 99.9999

Table REACTCLAS - Chemical Reactive Class and Rate Constants
(Primary Key: SAROAD)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	SAROAD	NUMBER	5		NOT NULL	SAROAD Chemical Code Domain: Table POLLUTANT
2	ARBREACT	NUMBER	1		NULL	ARB Reactive Class Domain: 1 - ROG 2 - Non-ROG

Table REACTCLAS - Chemical Reactive Class and Rate Constants (Cont.)
(Primary Key: SAROAD)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
3	EPAREACT	NUMBER	1		NULL	Epa Reactive Class Domain: 1 - VOC 2 - NON-VOC
4	O_RATE	NUMBER	15	8	NULL	Oxygen Rate Constant Range: 0-9999999.99999999
5	OH_RATE	NUMBER	15	8	NULL	OH Rate Constant Range: 0-9999999.99999999
6	03_RATE	NUMBER	15	8	NULL	0_3 Rate Constant Range: 0-9999999.99999999

Table STAFF - ARB and District Staff
(Primary Key: STAFF)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	STAFF	CHAR	10		NOT NULL	Oracle USERID
2	NAME	CHAR	30		NULL	Person
3	TELEPHONE	CHAR	25		NULL	Telephone Number
4	DIS	CHAR	3		NULL	ARB or District ID

Table SUBCO - Sub-county Identification
(Primary Key: CO + SUBCO)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
I	CO	NUMBER	2		NOT NULL	County Number Domain: Table COABDIS
2	SUBCO	CHAR	4		NOT NULL	Sub-county Indicator

Table UTMNORTH - UTM North Coordinates
(Primary Key: UZ + CO + AB + DIS)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	UZ	NUMBER	2		NOT NULL	UTM Zone Range: 10 - 11
2	CO	NUMBER	2		NOT NULL	County Number Domain: Table COABDIS
3	AB	CHAR	3		NOT NULL	Air Basin Domain: Table COABDIS
4	DIS	CHAR	3		NOT NULL	District Domain: Table COABDIS
5	MINUN	NUMBER	7	3	NULL	Minimum UTM North - Coordinates Range: 3600 - 4660 Kilometers
6	MAXUN	NUMBER	7	3	NULL	Maximum UTM North - Coordinates Range: 3600 - 4660 Kilometers

Table UTMEAST - UTM East Coordinates
(Primary Key: UZ + CO + AB + DIS)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	UZ	NUMBER	2		NOT NULL	UTM Zone Range: 10- 11
2	CO	NUMBER	2		NOT NULL	County Number Domain: Table COABDIS
3	AB	CHAR	3		NOT NULL	Air Basin Domain: Table COABDIS
4	DIS	CHAR	3		NOT NULL	District Domain: Table COABDIS
5	MINUE	NUMBER	6	3	NULL	Minimum UTM East Coordinates Range: 220 - 770 Kilometers
6	MAXUE	NUMBER	6	3	NULL	Maximum UTM East Coordinates Range: 220 - 770 Kilometers

Table UPD_WARN_LOG - Update Warning Log
(Primary Key: CO + FACID + AB + DEV + PROID + POL + WARNUP)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	CO	NUMBER	2		NOT NULL	County Number
2	FACID	NUMBER	9		NOT NULL	Facility ID
3	AB	CHAR	3		NOT NULL	Air Basin
4	DIS	CHAR	3		NOT NULL	District
5	DEV	NUMBER	6		NOT NULL	Device ID
6	PROID	NUMBER	14		NOT NULL	Process ID
7	POL	NUMBER	9		NOT NULL	SAROAD Pollutant Code
8	WARNUP	DATE	8		NOT NULL	Date and Time of Update Action
9	WARN_CODE	NUMBER	3		NULL	Warning Code
10	WARNUPID	CHAR	8		NULL	User Performing Update Action Domain: STAFF
11	WARN_MSG	CHAR	80		NULL	Message Area

SECTION FOUR

DEFINE (CODE-LOOKUP) TABLES

Table DEFAREAC - Telephone Area Codes
(Primary Key: AREAC)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	AREAC	NUMBER	3		NOT NULL	Area Code Range: 1 - 999

Table DEFCNTLEFFGRP - Control Efficiency Group
(Primary Key: CNTLEFFGRP)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	CNTLEFFGRP	CHAR	4		NOT NULL	Control Efficiency Group Code
2	CNTLEFFGRPN	CHAR	80		NULL	Control Efficiency Group Name

Table DEFDPWK - Weekly Operating Cycle Codes and Names
(Primary Key: DPWK)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	DPWK	NUMBER	2		NOT NULL	Days/week - Weekly Op. Cycle Code Range: 0 - 99
2	DPWKN	CHAR	80		NULL	Days/week-weekly Op. Cycle Desc

Table DEFEICMAT - Materials Description Codes and Names
(Primary Key: EICMAT)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	EICMAT	NUMBER	4		NOT NULL	Materials Description Code Range: O - 9999
2	EICMATN	CHAR	60		NULL	Name of Material

Table DEFEICSOU - Source Category Codes and Names
(Primary Key: EICSOU)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	EICSOU	NUMBER	3		NOT NULL	Source Category Code Range: 0 - 999
2	EICSOUN	CHAR	60		NULL	Source Category Name

Table DEFEICSUB - Emission Sub-Category Codes and Names
(Primary Key: EICSUB)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	EICSUB	NUMBER	4		NOT NULL	Emission Sub-category Code Range: 0 - 9999
2	EICSUBN	CHAR	60		NULL	Emission Sub-category Name

Table DEFEICSUM - Summary Category Codes and Names
(Primary Key: EICSUM)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	EICSUM	NUMBER	3		NOT NULL	Summary Category Code Range: 0 - 999
2	EICSUMN	CHAR	60		NULL	Summary Category Name
3	DIV	NUMBER	1		NULL	EIC Division
4	DIVN	CHAR	30		NULL	EIC Division Name
5	EIC 1	NUMBER	1		NULL	First Digit of EIC
6	EIC1N	CHAR	40		NULL	Name of First Digit of EIC

Table DEFEIC1 - First Digit of the EIC and Names
(Primary Key: EIC1)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	EIC1	NUMBER	1		NOT NULL	First Digit of EIC
2	EIC1N	CHAR	40		NULL	Name of First Digit of EIC

Table DEFEMORIG - Emission Factor Origin Codes and Names
(Primary Key: EMORIG)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	EMORIG	NUMBER	3		NOT NULL	Emission Factor Origin Code Range: 0 - 999
2	EMORIGN	CHAR	60		NULL	Emission Factor Origin Name

Table DEFEXTYPE - Excess Emission Type Codes And Names
(Primary Key: EXTYPE)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	EXTYPE	NUMBER	3		NOT NULL	Type of Excess Emissions Code Range: 0 - 999
2	EXTYPEN	CHAR	60		NULL	Type of Excess Emissions Name

Table DEFGROUP - Selected Group Codes and Names
(Primary Key: SELECTED_GRP)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	SELECTED_GRP	NUMBER	2		NOT NULL	Selected Group of Substance Code for Report
2	GRPNAME	CHAR	80		NULL	Descriptive Name of the Group

Table DEFHPDY - Daily Operating Cycle Codes and Names
(Primary Key: HPDY)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	HPDY	NUMBER	2		NOT NULL	Hours/day - Daily Op. Cycle Code Range: 0 - 99
2	HPDYN	CHAR	80		NULL	Hours/day - Daily Op. Cycle Description

Table DEFISDEFAULT - Code to indicate that Stack/Release Data (or Building/Property Data) are Default
(Primary Key: ISDEFAULT)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	ISDEFAULT	CHAR	2		NOT NULL	Code to indicate Stack/Release Data (or Building/Property Data) are Default
2	ISDEFAULTN	CHAR	80		NULL	Description of IsDefault Code

Table DEFLOCATION – Method of Collecting Coordinate Location Data
(Primary Key: LOC_METH)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	LOC_METH	CHAR	3		NOT NULL	Collection Method Code for Coordinate Location
2	LOC_METHN	CHAR	50		NULL	Collection Method Description

Table DEFMETH - Emissions Estimation Method Codes and Names
(Primary Key: METH)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	METH	NUMBER	2		NOT NULL	Method Code
2	METHN	CHAR	80		NULL	Method Name

Table DEFORGCAT - Organic Category Codes
(Primary Key: ORGCAT + ORGPROF)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	ORGCAT	NUMBER	4		NOT NULL	Organic Category Code Range: 0 - 9999
2	ORGPROF	NUMBER	5		NOT NULL	Organic Profile Code Domain: Table ORGPROFILE

Table DEFPRORIG - Process Rate Origin Codes and Names
(Primary Key: PRORIG)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	PRORIG	NUMBER	3		NOT NULL	Process Rate Origin Code
2	PRORIGN	CHAR	60		NULL	Process Rate Origin Name

Table DEFPRUN - Process Rate Unit Codes and Names
(Primary Key: PRUNITS)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	PRUNITS	NUM	4		NOT NULL	Process Rate Unit Code
2	PRUN	CHAR	30		NULL	Process Rate Unit Name

Table DEFREACT - Substance Reactivity Codes
(Primary Key: DMS)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	DMS	CHAR	8		NOT NULL	Detailed Model Species Code Domain: Table REACT
2	SAROAD	NUMBER	5		NULL	Saroad Code Domain: Table POLLUTANT
3	OGID	CHAR	8		NULL	Organic Gas ID
4	ADDRACTDAT	DATE	8		NULL	Date Added to Reactivity Table
5	DRPRACTDAT	DATE	8		NULL	Date Dropped from Reactivity Table
6	CHGRACTDAT	DATE	8		NULL	Date Changed on Reactivity Table
7	DELRACT	CHAR	1		NULL	Subst. Deleted from Reactivity Table Domain: Y - Yes N - No

Table DEFREASCH - Reason For Emission Change Codes and Names
(Primary Key: REASCH)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	REASCH	NUMBER	2		NOT NULL	Reason Emission Changed Code Range: 0 - 99
2	REASCHN	CHAR	80		NULL	Reason for Change Description

TABLE DEFSCC3EIC - MAPPING OF SCC3 TO EIC FOR REPORTING PURPOSES
(PRIMARY KEY: SCC3 + EIC)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	SCC3	NUMBER	3		NOT NULL	First 3 Digits of SCC
2	EIC	NUMBER	14		NOT NULL	EIC to be used

Table DEFWARNCODES - Warning Codes and Descriptions
(Primary Key: WARN CODE)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	WARN_CODE	NUMBER	3		NOT NULL	Warning Code
2	WARN_CODEN	CHAR	70		NULL	Warning Code Name/Description

Table EIC - Emission Inventory Codes
(Primary Key: EIC)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	EIC	NUMBER	14		NOT NULL	Emission Inventory Code Range: 0 – 99999999999999
2	EPA_AMS	NUMBER	9		NULL	EPA Area and Mobile Source SCC Code Range: 0 - 999999999
3	EICSUM	NUMBER	3		NOT NULL	Summary Category Code Domain: Table DEFEICSUM
4	EICSUMN	CHAR	60		NULL	Summary Category Name
5	EICSOU	NUMBER	3		NOT NULL	Source Category Code Domain: Table DEFEICSOU
6	EICSOUN	CHAR	60		NULL	Source Category Name
7	EICMAT	NUMBER	4		NOT NULL	Materials Description Code Domain: Table DEFEICMAT
8	EICMATN	CHAR	60		NULL	Name of Material
9	EICSUB	NUMBER	4		NOT NULL	Emission Sub-category Code Domain: Table DEFEICSUB
10	ICSUBN	CHAR	60		NULL	Emission Sub-category Name
11	EIC1	NUMBER	1		NOT NULL	First Digit of EIC Domain: Table DEFEIC1
12	EIC1N	CHAR	40		NULL	Name of First Digit of EIC
13	DIS_UPD_AUTH	CHAR	1		NULL	District Authority to Update A - ARB Update Only of ARB Category D - District or ARB Update of District Category B - Both ARB and District Allowed to Update ARB Category
14	EICN	CHAR	80		NULL	EIC Name for Area source Categories.

Table EQSIZEUNIT - Equipment Size Units
(Primary Key: EQUNITC)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	EQUNITC	NUMBER	5		NOT NULL	Equipment Size Units Code Range: 1 - 99999
2	EQUNITS	CHAR	30		NULL	Equipment Size Units

Table EQTYPE - Equipment Type
(Primary Key: EQTYPEC)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	EQTYPEC	NUMBER	5		NOT NULL	Equipment Type Code
2	EQTYPE	CHAR	80		NULL	Equipment Type Description

Table NAICS – North American Industrial Classification Code
(Primary Key: NAICS)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	NAICS	CHAR	6		NOT NULL	North American Industrial Classification
2	NAICS2	CHAR	2		NULL	First Two Digits of NAICS Range: 0 - 99
3	NAICS3	CHAR	3		NULL	First Three Digits of NAICS Range: 0 – 999
4	NAICS4	CHAR	4		NULL	First Four Digits of NAICS Range: 0 - 9999
5	NAICS5	CHAR	5		NULL	First Five Digits of NAICS Range: 0 – 99999
6	NAICSU	DATE	8		NULL	Date and Time of Last Update
7	NAICSN	CHAR	80		NULL	Short NAICS Name
8	NAICS2N	CHAR	80		NULL	Name of First 2 NAICS Digits - Sector
9	NAICS3N	CHAR	90		NULL	Name of First 3 NAICS Digits – Sub-Sector
10	NAICS4N	CHAR	110		NULL	Name of First 4 NAICS Digits – Industry Group
11	NAICS5N	CHAR	110		NULL	Name of First 5 NAICS Digits – Industry
12	NAICS6N	CHAR	120		NULL	Name of All 6 NAICS Digits – U.S. Industry
13	NAICSCRE	DATE	8		NULL	Date NAICS Was Created
14	NAICSDEL	DATE	8		NULL	Date NAICS Was Deleted
15	DELNAICS	CHAR	1		NULL	NAICS Deleted Range: D - Deleted Null - Not Deleted

Table SCC - Source Classification Codes
(Primary Key: SCC)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	SCC	NUMBER	14		NOT NULL	Source Classification Code or Range: 0 - 99999999999999
2	SCC3	NUMBER	3		NULL	First Three Digits of SCC Range: 0 - 999
3	SCC6	NUMBER	6		NULL	First Six Digits of SCC Range: 0-999999
4	COE .	NUMBER	9	4	NULL	CO Emission Factor (Lbs/Unit) Range: 0-99999.9999
5	NOXE	NUMBER	9	4	NULL	NOX Emission Factor (Lbs/Unit) Range: 0 - 99999.9999
6	SOXE	NUMBER	9	4	NULL	SOX Emission Factor (Lbs/Unit) Range: 0 - 99999.9999
7	VOCE	NUMBER	10	4	NULL	VOC Emission Factor (Lbs/Unit) Range: 0 - 9999999.9999
8	PME	NUMBER	9	4	NULL	PM Emission Factor (Lbs/unit) Range: 0 - 99999.9999 Domain: Table DEFEAM
9	SCCIN	CHAR	20		NULL	Name of First SCC Digit
10	SCC3N	CHAR	20		NULL	Name of First 3 SCC Digits
11	SCC6N	CHAR	20		NULL	Name of First 6 SCC Digits
12	SCC8N	CHAR	20		NULL	Name of All 8 SCC Digits
13	SCCD	CHAR	11		NULL	SCC Code with Dashes Inserted Range: 0-00-000-00 - 9-99-999-99
14	SCCUN	CHAR	25		NULL	SCC Units
15	RESPAG	CHAR	1		NULL	Agency Responsible for Area Estimate Domain: A - ARB D - District
16	SCCU	DATE	8		NULL	Date and Time of Last Update
17	SCCCRE	DATE	8		NULL	Date SCC Was Created by EPA
18	SCCDEL	DATE	8		NULL	Date SCC Was Deleted by EPA
19	DELSCC	CHAR	1		NULL	SCC Deleted by EPA Domain: D - Deleted Null - Not Deleted

Table SIC - Standard Industrial Classification
(Primary Key: SIC)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
1	SIC	NUMBER	14		NOT NULL	Standard Industrial Classification Code or Emission
2	SIC2	NUMBER	2		NULL	First Two Digits of SIC Range: 0 - 99
3	SIC3	NUMBER	3		NULL	First Three Digits of SIC Range: 0 - 999
4	SICU	DATE	8		NULL	Date and Time of Last Update
5	SICN	CHAR	30		NULL	Short SIC Name
6	SIC2N	CHAR	30		NULL	Name of First 2 SIC Digits
7	SIC3N	CHAR	30		NULL	Name of First 3 SIC Digits
8	SIC4N	CHAR	30		NULL	Name of All 4 SIC Digits

Table SIC - Standard Industrial Classification (Cont.)
(Primary Key: SIC)

COL	COL NAME	COL TYPE	WIDTH	DEC	NULLS	DESCRIPTION
9	SICCRE	DATE	8		NULL	Date SIC Was Created
10	SICDEL	DATE	8		NULL	Date SIC Was Deleted
11	DELSIC	CHAR	1		NULL	SIC Deleted Range: D - Deleted Null - Not Deleted

Appendix D

CEIDARS 2.5

Transaction Format Documents

Facility Transactions

Field Position	Field	Type	Requirement	Width	Dec	Description
1	TRANS_ID	Char	*	3		Transaction ID: 'FAC'
2	CO	Number	*	2		County Number
3	FACID	Number	*	9		Facility ID
4	AB	Char	*	3		Air Basin
5	DIS	Char	*	3		District
6	ACTION	Char	*	1		Action: (A)dd, (C)hange, or (D)elete
7	FNAME	Char	All	60		Name of Facility at Location
8	FSTREET	Char	All	60		Street Address Where Facility is Located
9	FCITY	Char	All	20		City Where Facility is Located
10	FZIP	Int	All	5		Facility Zip Code
11	FZIPEXT	Int	CERR,NEI	4		Facility Zip Code Extension
12	PCONTACT	Char	NEI	24		Phone Contact Person
13	AREAC	Int	NEI	3		Telephone Area Code
14	PHONE	Int	NEI	7		Telephone Number
15	FSIC	Int	*	4		Facility SIC Code – Domain: Table SIC
16	FNAICS	Char	CERR, NEI	6		Facility North American Industry Classification Domain: Table NAICS
17	NEMP	Int	CEI	5		Number of Employees
18	MNAME	Char	NEI	60		Company Name for Mailing Purposes
19	MSTREET	Char	NEI	60		Company Mailing Street
20	MCITY	Char	NEI	20		Company Mailing City
21	MSTATE	Char	NEI	2		Company Mailing State
22	MZIP	Int	NEI	5		Mail Zip Code
23	MZIPEXT	Int	NEI	4		Mail Zip Code Extension
24	MCONTACT	Char	NEI	24		Mail Contact Person
25	AQCR	Int	CEI	2		EPA Air Quality Control Region
26	FACSUBCO	Char	NEI	4		Facility Sub-County ID – Domain: Table SUBCO
27	CODESIG	Char	SIP	1		Area Designation for CO Domain: A – Attainment N – Non-attainment T – Non-attainment – Transitional U - Unclassified
28	NO2DESIG	Char	SIP	1		Area Designation for NO2 Domain: as in CODESIG
29	OZDESIG	Char	SIP	1		Area Designation for Ozone Domain: as in CODESIG
30	PMDESIG	Char	SIP	1		Area Designation for Particulate Matter Domain: as in CODESIG
31	SO2DESIG	Char	SIP	1		Area Designation for SO2 Domain: as in CODESIG
32	FAC_PHASE	Char	HOT	2		Phase Facility Brought into AB2588 Program Domain: P1 – 1st phase, >=25 TPY or Toxic Inv. Fac. P2 - 2rd phase, >=10 TPY & 25 TPY Fac. P3 – 3rd phase, <10 TPY Fac.
33	FAC_FORECAST	Char	CEI	1		Facility Used for Forecasting Purposes
34	PRIORITY	Char	HOT	1		Priority for Hot Spots Risk Level Domain: H – High I – Intermediate L – Low

Field Position	Field	Type	Requirement	Width	Dec	Description
35	INDUSTRYWIDE	Char	HOT	1		Included in Industry Wide
36	FACD1	Char		9		Reserved for District Use
37	FACD2	Char		9		Reserved for District Use
38	FRS_ID	Char	CEI	12		EPA Facility Registry System Identification
39	FAC_LOC_ONLY	Char	CH	1		Facility Location Only? Domain Y/N
40	CERR_CODE	Char	CERR	1		CERR Program Status. Domain A/B/NULL
41	COORD_SYS	Char	All	3		Coordinate System Used Domain: DD - Decimal degrees TA - Teale Albers, meters U10 - UTM10, kilometers U11 - UTM11, kilometers
42	DATUM	Char	All	5		Type of Datum Used Domain: NAD27 – North American Datum 1927 NAD83 – North American Datum 1983 WGS84 – World Geodetic System 1984
43	SPHEROID	Char	All	10		Shape Used for Ellipsoidal Earth Domain: Clarke1866 – Clark 1866 GRS80 – Geodetic Reference System 1980 WGS84 – World Geodetic System 1984 WGS72 – World Geodetic System 1972
44	X_USERCOORD	Number	All	12	6	X (East) User Coordinate in COORD_SYS Units
45	Y_USERCOORD	Number	All	13	6	Y (North) User Coordinate in COORD_SYS Units
46	LOC_METH	Char	All	3		Method of Collecting Coordinate Location Data Domain: Table DEFLOCATION
47	SMALL_COMM	Char	CH	1		Is Facility a Small Commercial Facility (i.e., Aggregated Point Source)? Domain: Y/N (May be expanded in future to use codes for specific types.)
48	FAC_UPDATE	Char	All	6		Updating Code Domain: SIP - SIP facility ANN – Annual Update CHS – CHAPIS Update AB2588 – AB2588 Update ALM – Almanac Update
49	CHAPIS	Char	CH, CEI	1		CHAPIS Facility? Domain Y/N
50	MAINTAINED	Char	CEI	1		Is Facility Agreed to be Regularly maintained by District (e.g., more frequently than 4-year Hot Spots cycle updates)?
51	VINTAGE_EMS	Int	CH, CEI	4		Year of Emissions Data (YYYY)
52	MEMO_FAC	Char		80		Comments on Facility [District option]
53	FACU_D	Date	CEI	8		District Updated Date (YYYYMMDD)
54	OPERATOR	Char	CEI	3		Operator Initials
55	TDATE	Date	*	8		Transaction Date (YYYYMMDD)

Facility Risk Transaction

Field Position	Field	Type	Requirement	Width	Dec	Description
1	TRANS_ID	Char	*	3		Transaction ID: 'RSK'
2	CO	Number	*	2		County Number
3	FACID	Number	*	9		Facility ID
4	AB	Char	*	3		Air Basin
5	DIS	Char	*	3		District
6	ACTION	Char	*	1		Action: (A)dd, (C)hange, or (D)elete
7	FEE_CAT	Char	HOT	1		Toxic Program Status Domain: A – Prioritization score > 10 B – HRA >= 10 and less than 50 C – HRA >= 50 and less than 100 D – HRA >= 100 E – Unprioritized (new facility) F – HRA and less than 10 G – Exempt H – Exempt, HRA < 1 M – Out, de minimis O – Out of business P – Exempt, prioritization score <= 1 U – District update facility – Prioritization score greater than 1 and ▶ 10.0
8	EXEMPT	Char	HOT	50		Exemption Status and Reason
9	VINTAGE_RISK	Int	CEI, CH, HOT	4		Year of Risk Data (YYYY)
10	VINTAGE_PS	Int	CEI, CH, HOT	4		Year of Prioritization Score (YYY)
11	SMALL_BUS	Char	HOT	1		Is facility a small business?
12	SIC_FEEREG	Int	HOT	4		SIC Code for facility in Fee Regulation
13	NUM_SCC	Number	HOT	3		Number of SC used by facility
14	PROXIMITY	Float	HOT	9	2	Receptor Proximity, meters
15	CANCEREPP	Float	CEI, HOT	8	2	Cancer Priority Score, Emissions and Potency Procedure
16	NONCANCEREPP	Float	CEI, HOT	7	2	Non-cancer Priority Score, Emissions and Potency Procedure
17	ACUTEEPP	Float	CEI, HOT	7	2	Acute Priority Score, Emissions and Potency Procedure
18	CHRONICEPP	Float	CEI, HOT	7	2	Chronic Priority Score, Emissions and Potency Procedure
19	CANCERDAP	Float	CEI, HOT	8	2	Cancer Priority Score, Dispersion Adjustment Procedure
20	NONCANCERDAP	Float	CEI, HOT	7	2	Non-cancer Priority Score, Dispersion Adjustment Procedure
21	ACUTEDAP	Float	CEI, HOT	7	2	Acute Priority Score, Dispersion Adjustment Procedure
22	CHRONICDAP	Float	CEI, HOT	7	2	Chronic Priority Score, Dispersion Adjustment Procedure
23	TS	Float	CEI, HOT	8	2	Total Priority Score
24	PRIORITY_MULT	Float	HOT	6	2	Priority Multiplier
25	HRA_CAN	Float	CH, HOT	7	2	Health Risk Assessment Cancer Risk
26	CHRONIC_HI	Number	CH, HOT	7	2	Chronic Hazard Index
27	ACUTE_HI	Number	CH, HOT	7	2	Acute Hazard Index

Field Position	Field	Type	Requirement	Width	Dec	Description
28	OPERATOR	Char	CEI	3		Operator Initials
29	TDATE	Date	*	8		Transaction Date (YYYYMMDD)

Stack Transactions

Field Position	Field	Type	Requirement	Width	Dec	Description
1	TRANS_ID	Char	*	3		Transaction ID: 'STK'
2	CO	Number	*	2		County Number
3	FACID	Number	*	9		Facility ID
4	AB	Char	*	3		Air Basin
5	DIS	Char	*	3		District
6	ACTION	Char	*	1		Action: (A)dd, (C)hange, or (D)elete
7	STK	Int	*	6		Stack ID
8	STKNAME	Char		60		Stack Name (Optional)
9	STKHT	Number	CERR, HARP	8	4	Stack Height (Feet)
10	STKDIAM	Number	CERR, HARP	4	1	Stack Diameter at Exit (feet)
11	GT	Number	CERR, HARP	5	1	Actual Gas Temp at Exit (Deg F)
12	GF	Number	CERR, HARP	10	2	Actual Gas Flow (CFM)
13	GV	Number	CERR, HARP	8	2	Actual Gas Velocity at Exit (Ft/min)
14	COORD_SYS	Char	All	3		Coordinate System Used Domain: DD - Decimal degrees TA - Teale Albers, meters U10 - UTM10, kilometers U11 - UTM11, kilometers
15	DATUM	Char	All	5		Type of Datum Used Domain: NAD27 – North American Datum 1927 NAD83 – North American Datum 1983 WGS84 – World Geodetic System 1984
16	SPHEROID	Char	All	10		Shape Used for Ellipsoidal Earth Domain: Clarke1866 GRS80 WGS84 WGS72
17	X_USERCOORD	Number	All	12	6	X (East) User Coordinate in COORD_SYS Units
18	Y_USERCOORD	Number	All	13	6	Y (North) User Coordinate in COORD_SYS Units
19	LOC_METH	Char	All	3		Method of Collecting Data Domain: Table DEFLOCATION
20	ELEV	Number	HOT	7	2	Elevation in Feet
21	SRCTYP	Char	HARP	7		Type of Release, as specified in ISC: POINT, VOLUME, AREA, or OPENPIT
22	SYINIT	Number	HARP	7	2	Initial Lateral Dimension of Volume Release, Feet
23	SZINIT	Number	HARP	7	2	Initial Vertical Dimension of Volume or Area Release (Optional for Area), feet
24	XINIT	Number	HARP	7	2	Square Length or Rectangular Side of Area Release, feet

Field Position	Field	Type	Requirement	Width	Dec	Description
25	YINIT	Number	HARP	7	2	Rectangular Side of Area or Open Pit Release (Optional for Area), feet
26	ANGLE	Number	HARP	5	2	Angle of Area or Open Pit Source, degree (Optional)
27	PITVOL	Number	HARP	15	2	Volume of Open Pit Source, ft^3
28	ISDEFAULT	Char	HARP	2		Code to indicate Stack Data are default
29	MEMO_STK	Char		80		Comment on Stack [District option]
30	STKU_D	Date		8		District Updated Date (YYYYMMDD)
31	OPERATOR	Char	CEI	3		Operator Initials
32	TDATE	Date	*	8		Transaction Date (YYYYMMDD)

Device Transactions

Field Position	Field	Type	Requirement	Width	Dec	Description
1	TRANS_ID	Char	*	3		Transaction ID: 'DEV'
2	CO	Number	*	2		County Number
3	FACID	Number	*	9		Facility ID
4	AB	Char	*	3		Air Basin
5	DIS	Char	*	3		District
6	ACTION	Char	*	1		Action: (A)dd, (C)hange, or (D)elete
7	DEV	Int	*	6		Device ID
8	DEVNM	Char	NEI	40		Local Name of this Device
9	PERID	Char	NEI	32		Local Permit ID
10	NUMDEV	Int	NEI	5		Number of Devices Represented
11	EQSIZE	Float	CEI	7	1	Equipment Size Range 0 – 999999.9
12	EQSIZE_CF	Char	CEI	1		Equipment Size Confidential Flag
13	EQUNITC	Int	CEI	5		Equipment Size Units Code Domain: Table EQSIZEUNIT
14	EQTYPEC	Int	CEI	5		Equipment Type Code Domain: Table EQTYPE
15	DEVSUBCO	Char	CEI	4		Sub-County Indicator Domain: Table SUBCO
16	SECT	Int		2		Section. Range: 1 - 36
17	TWNSHP	Int		2		Township. Range 1 – 50
18	TWNSHPB	Char		1		Township Base Domain: N – North S - South
19	RANGE	Int		2		Range. Range 1 – 50
20	RANGEB	Char		1		Range Base Domain: E – East W – West
21	DEVD1	Char		40		Reserved for District Use
22	DEVD2	Char		40		Reserved for District Use
23	DEVCAP	Number		6	2	Device Output Capacity in MegaWatt
24	MEMO_DEV	Char		80		Comments on Device Information [District option]
25	DEVU_D	Date		8		District Updated Date (YYYYMMDD)
26	OPERATOR	Char	CEI	3		Operator Initials
27	TDATE	Date	*	8		Transaction Date (YYYYMMDD)

Process Transactions

Field Position	Field	Type	Requirement	Width	Dec	Description
1	TRANS_ID	Char	*	3		Transaction ID: 'PRO'
2	CO	Number	*	2		County Number
3	FACID	Number	*	9		Facility ID
4	AB	Char	*	3		Air Basin
5	DIS	Char	*	3		District
6	ACTION	Char	*	1		Action: (A)dd, (C)hange, or (D)elete
7	DEV	Int	*	6		Device ID
8	PROID	Int	*	14		Process ID Domain: If FACID > 0, 1 – 99 Else Table EIC
9	PRDESC	Char	CEI	60		Process Description
10	SCC	Int	*	14		SCC or EIC If FACID > 0 Table SCC Else Table EIC
11	SIC	Int	CEI	14		Standard Industrial Classification or EIC Domain: If FACID > 0 Table SIC Else Table EIC
12	NAICS	Char	CERR, NEI, CEI	6		NAICS Code Domain: Table NAICS
13	PR	Int	CERR, NEI, CEI	11		Process Rate in SCC Units
14	PRUNITS	Int	CERR, NEI, CEI	4		Process Rate Unit Code
15	UPR	Float	CEI	12	1	Unreconciled Process Rate
16	MAXHR_PR	Int	CEI	9		Maximum Hourly Process Rate
17	MAXD	Float	CEI	9	3	Maximum Design Rate
18	HEAT	Float	CERR, NEI	8		Heat Content in Million BTU
19	ASH	Float	CERR, NEI	4	2	Ash Content, Weight Percent
20	S	Float	CERR, NEI, CEI	3	2	Percent Fuel Sulfur Content, Range 0 – 3.00
21	PRORIG	Int	CEI	3		Process Rate Origin Code
22	PRREL	Int	CEI	3		Process Rate Reliability
23	STK	Int	CEI	6		Stack ID
24	HPDY	Int	CERR, NEI, CEI	2		Operating Hours per Day Daily Domain: Table DEFHPDY
25	DPWK	Int	CERR, NEI, CEI	2		Operating Days per Week Domain: Table DEFDPWK
26	WPYR	Int	CERR, NEI, CEI	2		Operating Weeks per Year
27	YREST	Int	CERR, NEI, CEI	4		Year of Process/Emission Estimate Made
28	PROD1	Char		40		Reserved for District Use
29	PROD2	Char		40		Reserved for District Use
30	PR_FORECAST	Char	CEI	1		Process Specific Forecast Indicator
31	CONF	Char	CEI	1		Confidential Process Data
32	JANT	Float	CERR, NEI, CEI	4	1	Percent Activity for January
33	FEBT	Float	CERR, NEI, CEI	4	1	Percent Activity for February
34	MART	Float	CERR, NEI, CEI	4	1	Percent Activity for March

Field Position	Field	Type	Requirement	Width	Dec	Description
35	APRT	Float	CERR, NEI, CEI	4	1	Percent Activity for April
36	MAYT	Float	CERR, NEI, CEI	4	1	Percent Activity for May
37	JUNT	Float	CERR, NEI, CEI	4	1	Percent Activity for June
38	JULT	Float	CERR, NEI, CEI	4	1	Percent Activity for July
39	AUGT	Float	CERR, NEI, CEI	4	1	Percent Activity for August
40	SEPT	Float	CERR, NEI, CEI	4	1	Percent Activity for September
41	OCTT	Float	CERR, NEI, CEI	4	1	Percent Activity for October
42	NOVT	Float	CERR, NEI, CEI	4	1	Percent Activity for November
43	DECT	Float	CERR, NEI, CEI	4	1	Percent Activity for December
44	SPATIAL	Char	CEI	8		Spatial Distribution Parameter
45	SEST	Char	CEI	6		Agency Making Area Estimate
46	PRUP	Date	CEI	8		Date of Last Process Rate Update
47	OUTPUT	Number	CEI	8	2	Process Rate Output in MegaWatt
48	MEMO_PR	Char		80		Process Information Memo
49	ISDEFAULT	Char	All	2		Code to Indicate Link to Stack/Release ID is default
50	OPERATOR	Char	CEI	3		Operator Initials
51	TDATE	Date	*	8		Transaction Date (YYYYMMDD)

Emission Transactions

Field Position	Field	Type	Requirement	Width	Dec	Description
1	TRANS_ID	Char	*	3		Transaction ID: 'EMS'
2	CO	Number	*	2		County Number
3	FACID	Number	*	9		Facility ID
4	AB	Char	*	3		Air Basin
5	DIS	Char	*	3		District
6	ACTION	Char	*	1		Action: (A)dd, (C)hange, or (D)elete
7	DEV	Int	*	6		Device ID
8	PROID	Int	*	14		Process ID Domain: If FACID > 0, 1 – 99 Else Table EIC
9	POL	Int	*	9		Pollutant Code. Domain: Table POLLUTANT
10	UEMFACT	Int	CERR, NEI, CEI	10		Uncontrolled Emission Factor
11	CNTL1	Int	CERR, NEI, CEI	3		Primary Pol. Control Device Code
12	CNTL2	Int	CERR, NEI, CEI	3		Secondary Pol. Control Device Code
13	CNTLEFF	Float	CERR, NEI, CEI	4	1	Control Efficiency (Percent)

Field Position	Field	Type	Requirement	Width	Dec	Description
14	EMFACT	Int	CERR, NEI, CEI	10		Emission Factor (Lbs/SCC Units)
15	EMORIG	Int	CEI	3		Emission Factor Origin Code
16	EMREL	Int	CEI	3		Emission Factor Reliability
17	CR_FLAG	Int	CEI	1		Status of ROG/TOG/VOC/PM10/PM2.5 Domain: 0 – Original Record 1 – Calculation from PM/TOG 2 – Calculation from PM10/ROG 3 – Calculation from PM2.5/VOC
18	EMS	Float	*			Annual Emissions Units: Tons per year for criteria Pollutants Lbs per year for toxics Curies per year for Radionuclides
19	HRMAXEMS	Float	HARP			Maximum Hourly Emissions
20	METH	Int	HOT	2		Emission Calculation Method Code Domain: Table DEFMETH
21	REASCH	Int	CEI	2		Reason Emission Changed Code Domain: Table DEFREASCH
22	EXEMS	Float	CEI			Total Excess Emissions
23	UNREMS	Float	CEI	9	1	Unreconciled Emissions (Tons/year)
24	POTENTIAL	Float	CEI			Potential Emissions for District's Use
25	EMS_FORECAST	Char	CEI	1		Pollutant Specific Forecast Indicators
26	EMSUP	Date	CEI	8		Date of Last EMS update by District
27	MAINTAINED	Char	All	1		Flag to Indicate Whether the Emissions for this Pollutant are Agreed to be regularly Maintained by the District
28	MEMO_EMS	Char		80		Comments on Emission Information [District option]
29	OPERATOR	Char	CEI	3		Operator Initials
30	TDATE	Date	*	8		Transaction Date (YYYYMMDD)

Excess Emission Transactions

Field Position	Field	Type	Requirement	Width	Dec	Description
1	TRANS_ID	Char	*	3		Transaction ID: 'EXC'
2	CO	Number	*	2		County Number
3	FACID	Number	*	9		Facility ID
4	AB	Char	*	3		Air Basin
5	DIS	Char	*	3		District
6	ACTION	Char	*	1		Action: (A)dd, (C)hange, or (D)elete
7	DEV	Int	*	6		Device ID
8	PROID	Int	*	14		Process ID
9	POL	Int	*	9		Pollutant Code
10	EXTYPE	Int	*	3		Type of Excess Emissions Code
11	EXQTR	Int	*	1		Quarter of Year of Excess Emissions
12	EXYR	Int	*	4		Calendar Year of Excess Emissions
13	EXCESS	Float	*			Excess Emissions
14	OPERATOR	Char	CEI	3		Operator Initials
15	TDATE	Date	*	8		Transaction Date (YYYYMMDD)

Supplemental Transactions

Field Position	Field	Type	Requirement	Width	Dec	Description
1	TRANS_ID	Char	*	3		Transaction ID: 'SUP'
2	CO	Number	*	2		County Number
3	FACID	Number	*	9		Facility ID
4	AB	Char	*	3		Air Basin
5	DIS	Char	*	3		District
6	ACTION	Char	*	1		Action: (A)dd, (C)hange, or (D)elete
7	POL	Int	*	9		Pollutant Code
8	USED	Char		1		Is this Substance Used?
9	PRODUCED	Char		1		Is this Substance Present?
10	PRESENT	Char		1		Is this Substance Otherwise Present?
11	HOW_PRESENT	Char		39		How Substance Is Otherwise Present
12	OPERATOR	Char	CEI	3		Operator Initials
13	TDATE	Date	*	8		Transaction Date (YYYYMMDD)

Building Transactions

Field Position	Field	Type	Requirement	Width	Dec	Description
1	TRANS_ID	Char	*	3		Transaction ID: 'BLD'
2	CO	Number	*	2		County Number
3	FACID	Number	*	9		Facility ID
4	AB	Char	*	3		Air Basin
5	DIS	Char	*	3		District
6	ACTION	Char	*	1		Action: (A)dd, (C)hange, or (D)elete
7	ID	Int	*	5		Building ID
8	TIER	Int	*	5		Tier ID
9	DESCRIPTION	Char	HARP	80		Building Description
10	HEIGHT	Float	HARP	5	2	Building Height from Ground Level, Meters
11	ELEVATION	Float	HARP	7	2	Elevation of Base of Building, Feet
12	NPTS	Int	HARP	2		Number of Vertex Points
13	ISDEFAULT	Char	HARP	2		Code to indicate Building Data are Default
14	OPERATOR	Char	CEI	3		Operator Initials
15	TDATE	Date	*	8		Transaction Date (YYYYMMDD)

Building Point Transactions

Field Position	Field	Type	Requirement	Width	Dec	Description
1	TRANS_ID	Char	*	3		Transaction ID: 'BLP'
2	CO	Number	*	2		County Number
3	FACID	Number	*	9		Facility ID
4	AB	Char	*	3		Air Basin
5	DIS	Char	*	3		District
6	ACTION	Char	*	1		Action: (A)dd, (C)hange, or (D)elete
7	ID	Int	*	5		Building ID
8	TIER	Int	*	5		Tier ID
9	POINTID	Int	*	5		Vertex Point ID
10	PLOTORDER	Int	HARP	5		Plot Order
11	UTME	Float	HARP	9	2	UTM East Offset In Meters, Relative to Facility
12	UTMN	Float	HARP	10	2	UTM North Offset In Meters, Relative to Facility
13	OPERATOR	Char	CEI	3		Operator Initials
14	TDATE	Date	*	8		Transaction Date (YYYYMMDD)

Property Transactions

Field Position	Field	Type	Requirement	Width	Dec	Description
1	TRANS_ID	Char	*	3		Transaction ID: 'PRT'
2	CO	Number	*	2		County Number
3	FACID	Number	*	9		Facility ID
4	AB	Char	*	3		Air Basin
5	DIS	Char	*	3		District
6	ACTION	Char	*	1		Action: (A)dd, (C)hange, or (D)elete
7	ID	Int	*	5		Property ID
8	DESCRIPTION	Char	HARP	80		Property Description
9	NPTS	Int	HARP	5		Number of Vertex Points
10	ISDEFAULT	Char	HARP	2		Code to indicate Property Data are Default
11	OPERATOR	Char	CEI	3		Operator Initials
12	TDATE	Date	*	8		Transaction Date (YYYYMMDD)

Property Point Data Transactions

Field Position	Field	Type	Requirement	Width	Dec	Description
1	TRANS_ID	Char	*	3		Transaction ID: 'PRP'
2	CO	Number	*	2		County Number
3	FACID	Number	*	9		Facility ID
4	AB	Char	*	3		Air Basin
5	DIS	Char	*	3		District
6	ACTION	Char	*	1		Action: (A)dd, (C)hange, or (D)elete
7	ID	Int	*	5		Property ID
8	POINTID	Int	*	5		Vertex Point ID
9	PLOTORDER	Int	HARP	5		Plot Order
10	UTME	Float	HARP	9	2	UTM East Offset In Meters, Relative to Facility
11	UTMN	Float	HARP	10	2	UTM North Offset In Meters, Relative to Facility
12	ELEVATION	Float	HARP	7	2	Elevation, Feet
13	OPERATOR	Char	CEI	3		Operator Initials
14	TDATE	Date	*	8		Transaction Date (YYYYMMDD)

Receptor Transactions

Field Position	Field	Type	Requirement	Width	Dec	Description
1	TRANS_ID	Char	*	3		Transaction ID: 'RCP'
2	CO	Number	*	2		County Number
3	RECID	Number	*	10		Receptor ID
4	AB	Char	*	3		Air Basin
5	DIS	Char	*	3		District
6	ACTION	Char	*	1		Action: (A)dd, (C)hange, or (D)elete
7	RECGROUP	Char	*	8		Receptor Group
8	RECNAME	Char	HARP	50		Receptor Name
9	RECTYPE	Char	HARP	8		Receptor Type
10	POPRES	Number	HARP	6		Resident Population
11	POPWORK	Number	HARP	6		Worker Population
12	ELEV	Number	HARP	7	2	Elevation in feet
13	COORD_SYS	Char	All	3		Coordinate System Used Domain: DD - Decimal degrees TA - Teale Albers, meters U10 - UTM10, kilometers U11 - UTM11, kilometers
14	DATUM	Char	All	5		Type of Datum Used Domain: NAD27 – North American Datum 1927 NAD83 – North American Datum 1983 WGS84 – World Geodetic System 1984

Field Position	Field	Type	Requirement	Width	Dec	Description
15	SPHEROID	Char	All	10		Shape Used for Ellipsoidal Earth Domain: Clarke1866 – Clark 1866 GRS80 – Geodetic Reference System 1980 WGS84 – World Geodetic System 1984 WGS72 – World Geodetic System 1972
16	X_USERCOORD	Number	All	12	6	X (East) User Coordinate in COORD_SYS Units
17	Y_USERCOORD	Number	All	13	6	Y (North) User Coordinate in COORD_SYS Units
18	LOC_METH	Char	All	3		Method of Collecting Coordinate Location Data Domain: Table DEFLOCATION
19	OPERATOR	Char	CEI	3		Operator Initials
20	TDATE	Date	*	8		Transaction Date (YYYYMMDD)

Appendix E

Chemical Group Definitions for

Facility Summary Report

Appendix E
Definition of Pre-Defined Chemical Groups For Creating Facility Reports

This appendix defines the substances in the chemical groups listed in the HARP Facility Summary Report window [from HARP main menu choose ***Reports/Emission Summaries/***]. When you create an emission summary report you have the option of choosing from pre-defined groups of substances. These predefined groups are old report formats from the Air Toxics Emission Inventory Data System (ATEDS). The number of pollutants displayed in each report was determined by how many substances could legibly be printed on a page. For more information, see section 6.5.1.

Aldehydes (file name aldehyde.pol)

CAS Number	Name	Abbreviation
75070	Acetaldehyde	Acetaldehyde
107028	Acrolein	Acrolein
50000	Formaldehyde	Formaldehyde
111308	Glutaraldehyde	Glutaraldhyd

Aromatics I (file name aromat1.pol)

CAS Number	Name	Abbreviation
71432	Benzene	Benzene
1085	Dioxins, total, with individ. isomers also reported {PCDDs}	Dioxins-w/
1080	Dibenzofurans (chlorinated) {PCDFs}	Furans
1150	PAHs, total, with individ. components also reported PAHs-w/	
1336363	Polychlorinated biphenyls (PCBs)	PCBs

Aromatics II (aromat2.pol)

CAS Number	Name	Abbreviation
50328	Benzo[a]pyrene	B[a]P
118741	Hexachlorobenzene	HexaClBenzene
100425	Styrene	Styrene
106467	p-Dichlorobenzene	p-DiClBenzene
108952	Phenol	Phenol

Aromatics III (file aromat3.pol)

CAS Number	Name	Abbreviation
71432	Benzene	Benzene
108907	Chlorobenzene	Chlorobenzn
91203	Naphthalene	Naphthalene
108883	Toluene	Toluene
1210	Xylenes (mixed)	Xylenes

Organics I (file organic1.pol)

CAS Number	Name	Abbreviation
56235	Carbon tetrachloride	CCl4
75092	Methylene chloride {Dichloromethane}	Methylene Chlor
127184	Perchloroethylene {Tetrachloroethene}	Perc
71556	Methyl chloroform {1,1,1-TCA}	1,1,1-TCA
79016	Trichloroethylene	TCE

Organics II (organic2.pol)

CAS Number	Name	Abbreviation
106990	1,3-Butadiene	1,3-Butadiene
76131	Chlorinated fluorocarbon {CFC-113}	CFC-113
67663	Chloroform	Chloroform
7521	Ethylene oxide	EtO
75014	Vinyl chloride	Vinyl Chloride

PAH Dioxins (file pahdiox.pol)

CAS Number	Name	Abbreviation
1150	PAHs, total, with individ. components also reported	PAHs-w/
1151	PAHs, total, w/o individ. components reported	PAHs-w/o
1085	Dioxins, total, with individ. isomers also reported {PCDDs}	Dioxins-w/
1086	Dioxins, total, w/o individ. isomers reported {PCDDs}	Dioxins-w/o
1080	Dibenzofurans (chlorinated) {PCDFs}	DiBenFurans(Cl)

Metals I (file metals1.pol)

CAS Number	Name	Abbreviation
7440382	Arsenic	Arsenic
7440417	Beryllium	Beryllium
7440439	Cadmium	Cadmium
18540299	Chromium, hexavalent (& compounds)	Cr(VI)
7440020	Nickel	Nickel

Metals II (file metals2.pol)

CAS Number	Name	Abbreviation
7439921	Lead	Lead
7439965	Manganese	Manganese
7439976	Mercury	Mercury
7782492	Selenium	Selenium
7440666	Zinc	Zinc

Metals 9 (filemetals9.pol)

CAS Number	Name	Abbreviation
7440382	Arsenic	Arsenic
7440417	Beryllium	Beryllium
7440439	Cadmium	Cadmium
18540299	Chromium, hexavalent (& compounds)	Cr(VI)
7439921	Lead	Lead
7439965	Manganese	Manganese
7439976	Mercury	Mercury
7440020	Nickel	Nickel
7782492	Selenium	Selenium

Appendix F

ISC Input Parameter Description

Appendix F

ISC Input Parameter Description

DESCRIPTION OF CONTROL PATHWAY KEYWORDS

Keywords	Type	Keyword Description
STARTING	M - N	Identifies the start of CONTROL pathway inputs
TITLEONE	M - N	First line of title for output
TITLETWO	O - N	Optional second line of title for output
MODELOPT	M - N	Job control and dispersion options
AVERTIME	M - N	Averaging time(s) to process
POLLUTID	M - N	Identifies type of pollutant being modeled
HALFLIFE	O - N[1]	Optional half life used for exponential decay
DCAYCOEF	O - N[1]	Optional decay coefficient
TERRHGTS	O - N	Specifies whether to assume flat terrain (default) or to allow use of receptors on elevated terrain
ELEVUNIT[2]	O - N	Defines input units for receptor elevations (defaults to meters)
FLAGPOLE	O - N	Specifies whether to accept receptor heights above local terrain (m) for use with flagpole receptors, and allows for a default flagpole height to be specified
RUNORNOT	M - N	Identifies whether to run model or process setup information only
EVENTFIL[3]	O - N	Specifies whether to generate an input file for EVENT model (Applies to ISCST Only)
SAVEFILE[4]	O - N	Option to store intermediate results for later restart of the model after user or system interrupt (Applies to ISCST Only)
INITFILE[4]	O - N	Option to initialize model from file of intermediate results generated by SAVEFILE option (Applies to ISCST Only)
MULTYEAR[4]	O - N	Option to process multiple years of meteorological data (one year per run) and accumulate high short term values across years (Applies to ISCST Only)
ERRORFIL	O - N	Option to generate detailed error listing file (error file is mandatory for CO RUNORNOT NOT case)
FINISHED	M - N	Identifies the end of CONTROL pathway inputs

Type: M - Mandatory N - Non-Repeatable
O - Optional R - Repeatable

1) Either HALFLIFE or DCAYCOEF may be specified. If both cards appear a warning message will be issued and the first value entered will be used in calculations. Default assumes a half life of 4 hours for SO_2 modeled in urban mode.

2) The CO ELEVUNIT card is obsolescent with this version of the ISC models. The new RE ELEVUNIT card should be used instead to specify elevation units for receptors.

3) The EVENTFIL keyword controls whether or not to generate an input file for the ISCEV (EVENT) model. The primary difference between ISCST and ISCEV processing is in the treatment of source group contributions. The ISCST model treats the source groups independently, whereas the ISCEV model determines individual source contributions to particular events, such as the design concentrations determined from ISCST, or user-specified events. By specifying the EVENTFIL keyword, an input runstream file will be generated that can be used directly with the ISCEV model. The events included in the generated ISCEV model input file are defined by the RECTABLE and MAXIFILE keywords on the OU pathway, and are placed in the EVent pathway. If more than one output type (CONC, DEPOS, DDEP, and/or WDEP) is selected for the ISCST model, only events associated with the first output type, in the order stated above, are included in the EVENT model input file.

4) The SAVEFILE and INITFILE keywords work together to implement the model's re-start capabilities. Since the MULTYEAR option utilizes the re-start features in a special way to accumulate high short term values from year to year, it cannot be used together with the SAVEFILE or INITFILE keyword in the same model run.

DESCRIPTION OF CONTROL PATHWAY KEYWORDS AND PARAMETERS

Keyword	Parameters	
TITLEONE	Title1	
where:	Title1	First line of title for output, character string of up to 68 characters
TITLETWO	Title2	
where:	Title2	Optional second line of title for output, character string of up to 68 characters
MODELOPT	DFAULT CONC DRYDPLT WETDPLT RURAL GRDRIS NOSTD NOBID NOCALM MSGPRO NOSMPL (ST) DEPOS or or DDEP URBAN NOCMPL and/or WDEP DFAULT CONC DRYDPLT RURAL GRDRIS NOSTD NOBID (LT) DEPOS or or URBAN DDEP	
where:	DFAULT	Specifies use of regulatory default options (final rise, stack tip downwash, BID, calms processing, "upper bound" wake calcs, default exponents and DTDZ), overrides presence of GRDRIS, NOSTD, NOBID, NOCALM, and MSGPRO keywords
	CONC	Specifies calculation of concentration values
	DEPOS	Specifies calculation of total deposition flux (both dry and wet) for Short Term, and dry deposition flux for Long Term
	DDEP	Specifies calculation of dry deposition flux only
	WDEP	Specifies calculation of wet deposition flux only (ST only)
	DRYDPLT	Specifies inclusion of plume depletion due to dry removal
	WETDPLT	Specified inclusion of plume depletion due to wet removal (ST only)
	RURAL	Specifies use of rural dispersion
	URBAN	Specifies use of urban dispersion
	GRDRIS	Option to use gradual plume rise
	NOSTD	Option to use no stack-tip downwash
	NOBID	Option to use no buoyancy-induced dispersion
	NOCALM	Option to bypass calms processing routine (ST only)
	MSGPRO	Option to use missing data processing routines (ST only)
	NOSMPL	Option to suppress simple terrain calculations, i.e., use COMPLEX1 algorithms only (ST only)
	NOCMPL	Option to suppress complex terrain calculations, i.e., use ISCST algorithms only (ST only)
AVERTIME	Time1 Time2 Time3 Time4 MONTH PERIOD (ISCST and ISCEV only) or ANNUAL	
where:	TimeN	Nth optional averaging time (1, 2, 3, 4, 6, 8, 12, 24-hr; number of periods limited by NAVE parameter)
	MONTH	Option to calculate MONTHly averages (counts toward NAVE limit)
	PERIOD	Option to calculate averages for the entire data PERIOD
	ANNUAL	Option to calculate ANNUAL averages for the entire data

DESCRIPTION OF CONTROL PATHWAY KEYWORDS AND PARAMETERS

AVERTIME	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC (ISCLT model) WINTER SPRING SUMMER FALL or QUART1 QUART2 QUART3 QUART4 MONTH SEASON QUARTR ANNUAL PERIOD	
where:	JAN	Option to calculate JANuary averages from STAR data
	FEB	Option to calculate FEBruary averages from STAR data
	DEC	Option to calculate DECember averages from STAR data
	WINTER	Option to calculate WINTER averages from STAR data
	SPRING	Option to calculate SPRING averages from STAR data
	SUMMER	Option to calculate SUMMER averages from STAR data
	FALL	Option to calculate FALL averages from STAR data
	QUART1	Option to calculate QUART1 averages from STAR data
	QUART2	Option to calculate QUART2 averages from STAR data
	QUART3	Option to calculate QUART3 averages from STAR data
	QUART4	Option to calculate QUART4 averages from STAR data
	MONTH	Option to calculate averages for all twelve MONTHs
	SEASON	Option to calculate averages for all four SEASONs
	QUARTR	Option to calculate averages for all four QUARTeRs
	ANNUAL	Option to calculate annual values from an ANNUAL STAR summary
	PERIOD	Option to calculate averages for the entire data PERIOD
POLLUTID	Pollut	
where:	Pollut	Identifies type of pollutant being modeled. Any name of up to eight characters may be used, e.g., SO2, NOX, CO, PM10, TSP or OTHER. Selection of SO2 with the URBAN DFAULT options forces use of a half life of 4 hours for exponential decay. Use of PM10, PM-10 or OTHER allows for the use of the MULTYEAR option.
HALFLIFE	Haflif	
where:	Haflif	Half life used for exponential decay (s)
DCAYCOEF	Decay	
where:	Decay	Decay coefficient for exponential decay (s^{-1}) = 0.693/HAFLIF
TERRHGTS	FLAT or ELEV	
where:	FLAT	Specifies that flat terrain will be assumed for all calculations (default)
	ELEV	Specifies that receptors may be located on elevated terrain (chopped off at release height) Note that if ELEVated receptors are allowed, then receptor heights must be input on the RE pathway, or they will be assumed to be 0.0.
ELEVUNIT	METERS or FEET	
where:	METERS	Specifies input units for terrain (receptor) elevations of meters
	FEET	Specifies input units for terrain (receptor) elevations of feet Note: This keyword applies to receptor elevations only.
FLAGPOLE	(Flagdf)	
where:	Flagdf	Default value for height of (flagpole) receptors above local ground level, a default value of 0.0 m is used if this optional parameter is omitted

Note: The CO ELEVUNIT card is obsolescent with this version of the ISC models. The new RE ELEVUNIT card should be used instead to specify elevation units for receptors. If the CO ELEVUNIT card is present, it will be processed as it was in the previous version of the ISC models, but it cannot be used when an ELEVUNIT card is present on either the SO, RE or TG pathways.

RUNORNOT	RUN or NOT	
where:	RUN NOT	Indicates to run full model calculations Indicates to process setup data and report errors, but to not run full model calculations
EVENTFIL	(Evfile) (Evopt)	
where:	Evfile Evopt	Identifies the filename to be used to generate a file for input to EVENT model (Default=EVENTFIL.INP) Optional parameter to specify the level of output detail selected for the EVENT model: either SOCONT or DETAIL (default is DETAIL if this parameter is omitted)
SAVEFILE	(Savfil) (Dayinc) (Savfl2)	
where:	Savfil Dayinc Savfl2	Specifies name of disk file to be used for storing intermediate results (default = SAVE.FIL) file is overwritten after each dump) Number of days between dumps (optional: default is 1) Optional second disk filename to be used on alternate dumps - eliminates risk of system crash during the dump. If blank, file is overwritten each time.
INITFILE	(Inifil)	
where:	Inifil	Specifies name of disk file of intermediate results to be used for initializing run (default = SAVE.FIL)
MULTYEAR	Savfil (Inifil)	
where:	Savfil Inifil	Specifies name of disk file to be used for storing results at end of the year Optional name of disk file used for initializing the results arrays from previous year(s). The Inifil parameter is not used for the first year in the multi-year run.
ERRORFIL	(Errfil) (DEBUG)	
where:	Errfil DEBUG	Specifies name of detailed error listing file (default = ERRORS.LST) Option to provide detailed output for debugging purposes, e.g., plume heights, sigmas, etc. Generates Very Large Files -- Use with CAUTION!!!

DESCRIPTION OF SOURCE PATHWAY KEYWORDS

SO Keywords	Type	Keyword Description
STARTING	M -N	Identifies the start of SOURCE pathway inputs
ELEVUNIT	O - N	Defines input units for source elevations (defaults to meters), must be first keyword after SO STARTING if used.
LOCATION	M -R	Identifies coordinates for particular source
SRCPARAM	M -R	Identifies source parameters for a particular source
BUILDHGT	O - R	Building height values for each wind sector
BUILDWID	O - R	Building width values for each wind sector
LOWBOUND	O - R	Switch to use non-DFAULT option for "lower bound" wake calculations, controlled by sector
EMISFACT	O - R	Optional input for variable emission rate factors
EMISUNIT	O - N	Optional conversion factors for emissions, concentrations, and depositions
CONCUNIT	O - N	Optional conversion factors for emissions and concentrations
DEPOUNIT	O - N	Optional conversion factors for emissions and depositions
PARTDIAM	O - R	Input variables for optional input of particle size (microns)
MASSFRAX	O - R	Optional input of mass fraction for each particle size category
PARTDENS	O - R	Optional input of particle density (g/cm^3) for each size category
PARTSLIQ	O - R	Optional input of scavenging coefficient $(s\text{-}mm/hr)^{-1}$ of particulates for liquid precipitation
PARTSICE	O - R	Optional input of scavenging coefficient $(s\text{-}mm/hr)^{-1}$ of particulates for frozen precipitation
GAS-SCAV	O - R	Optional input of scavenging coefficient $(s\text{-}mm/hr)^{-1}$ of gases for liquid or frozen precipitation
HOUREMIS	O - R	Option for specifying hourly emission rates in a separate file
SRCGROUP[1]	M -R	Identification of source groups
FINISHED	M -N	Identifies the end of SOURCE pathway inputs

1) Source groups are treated independently for ISCST. The ISCEV (EVENT) model provides the contribution from each source to the group total for each specified event.

DESCRIPTION OF SOURCE PATHWAY KEYWORDS AND PARAMETERS

Keyword	Parameters	
ELEVUNIT	METERS or FEET	
where:	METERS	Specifies input units for source elevations of meters
	FEET	Specifies input units for source elevations of feet Note: This keyword applies to source elevations only.
LOCATION	Srcid Srctyp Xs Ys (Zs)	
where:	Srcid	Source identification code (alphanumeric string of up to eight characters)
	Srctyp	Source type: POINT, VOLUME, AREA, OPENPIT
	Xs	x-coord of source location, corner for AREA and OPENPIT (in m)
	Ys	y-coord of source location, corner for AREA and OPENPIT (in m)
	Zs	Optional z-coord of source location (elevation above mean sea level, defaults to 0.0 if omitted)
SRCPARAM	Srcid Ptemis Stkhgt Stktmp Stkvel Stkdia Vlemis Relhgt Syinit Szinit Aremis Relhgt Xinit (Yinit) (Angle) (Szinit) Pitemis Relhgt Xinit Yinit Pitvol (Angle)	
where:	Srcid	Source identification code
	__Emis	Source emission rate: in g/s for Ptemis or Vlemis, g/(sm^2) for Aremis or Pitemis for concentration or deposition
	___Hgt	Source physical release height above ground (center of height for VOLUME, height above base of pit for OPENPIT)
	Stktmp	Stack gas exit temperature (K)
	Stkvel	Stack gas exit velocity (m/s)
	Stkdia	Stack inside diameter (m)
	Syinit	Initial lateral dimension of VOLUME source (m)
	Szinit	Initial vertical dimension of VOLUME or AREA source (m) (optional parameter for AREA sources, assumed to be 0.0 if omitted)
	Xinit	Length of side of AREA or OPENPIT source in X-direction (m)
	Yinit	Length of side of AREA or OPENPIT source in Y-direction (m) (optional for AREA sources, assumed to be equal to Xinit if omitted)
	Angle	Orientation angle of AREA or OPENPIT source relative to North (degrees), measured positive clockwise, rotated around the source location, (Xs,Ys) (optional parameter, assumed to be 0.0 if omitted)
	Pitvol	Volume of open pit (m^3)
BUILDHGT	Srcid (or Srcrng) Dsbh(i), i=1,36 (16 for LT)	

where:	Srcid	Source identification code
	Srcrng	Range of sources (inclusive) for which building dimensions apply, entered as two alphanumeric strings separated by a '-'
	Dsbh	Array of direction-specific building heights (m) beginning with 10 degree flow vector and incrementing by 10 degrees clockwise
BUILDWID	Srcid (or Srcrng) Dsbw(i), i=1,36 (16 for LT)	
where:	Srcid	Source identification code
	Srcrng	Range of sources (inclusive) for which building dimensions apply
	Dsbw	Array of direction-specific building widths (m) beginning with 10 degree flow vector and incrementing by 10 degrees clockwise

LOWBOUND	Srcid (or Srcrng) Idswak(i), i=1,36 (16 for LT)	
where:	Srcid	Source identification code
	Srcrng	Range of sources (inclusive) for which LOWBOUND option applies
	Idswak	Array of direction-specific wake option switches beginning with 10 degree flow vector and incrementing by 10 degrees clockwise (0=upper bound, 1=lower bound)
EMISFACT	Srcid (or Srcrng) Qflag Qfact(i), i=1,n	
where:	Srcid	Source identification code
	Srcrng	Range of sources (inclusive) for which emission rate factors apply
	Qflag	Variable emission rate flag: Short Term Model: SEASON for seasonal; MONTH for monthly; HROFDY for hour-of-day; STAR for speed-by-stability; SEASHR for season-by-hour Long Term Model: SEASON for seasonal; MONTH for monthly; SSTAB for season-by-stability; SSPEED for season-by-speed; STAR for speed-by-stability; SSTAR for season-by-speed-and-stability
	Qfact	Array of scalar emission rate factors, for: SEASON, n=4; MONTH, n=12; HROFDY, n=24; STAR, n=36; SSTAB, n=24; SSPEED, n=24; SEASHR, n=96; SSTAR, n=144
EMISUNIT	Emifac Emilbl Conlbl or Deplbl	
where:	Emifac	Emission rate factor used to adjust units of output (default value is 1.0 E06 for CONC for grams to micrograms; and 3600. for DEPOS, DDEP or WDEP for grams/sec to grams/hour; Note that ISCLT emission rates are automatically adjusted for the number of hours in the STAR period for deposition calculations) Label to use for emission units (default is grams/sec)
	Emilbl	Label to use for concentrations (default is micrograms/m^3)
	Conlbl	Label to use for deposition (default is grams/m^2)
	Deblbl	
CONCUNIT	Emifac Emilbl Conlbl (Applies to ISCST Only)	
where:	Emifac	Emission rate factor used to adjust units of output for concentration (default value is 1.0 E06)
	Emilbl	Label to use for emission units (default is grams/sec)
	Conlbl	Label to use for concentrations (default is micrograms/m^3)
DEPOUNIT	Emifac Emilbl Deplbl (Applies to ISCST Only)	
where:	Emifac	Emission rate factor used to adjust units of output for deposition (default value is 3600.)
	Emilbl	Label to use for emission units (default is grams/sec)
	Deblbl	Label to use for deposition (default is grams/m^2)

PARTDIAM	Srcid (or Srcrng) Pdiam(i), i=1,Npd	
where:	Srcid	Source identification code
	Srcrng	Range of sources (inclusive) for which size categories apply
	Pdiam	Array of particle diameters (microns)
MASSFRAX	Srcid (or Srcrng) Phi(i), i=1,Npd	
where:	Srcid	Source identification code
	Srcrng	Range of sources (inclusive) for which mass fractions apply
	Phi	Array of mass fractions for each particle size category
PARTDENS	Srcid (or Srcrng) Pdens(i), i=1,Npd	
where:	Srcid	Source identification code
	Srcrng	Range of sources (inclusive) for which particle densities apply
	Pdens	Array of particle densities (g/cm^3) for each size category
PARTSLIQ	Srcid (or Srcrng) Scavcoef(i), i=1,Npd	
where:	Srcid	Source identification code
	Srcrng	Range of sources (inclusive) for which scavenging coefficients apply
	Scavcoef	Scavenging coefficient $(s\text{-}mm/hr)^{-1}$ for liquid precipitation for each size category
PARTSICE	Srcid (or Srcrng) Scavcoef(i), i=1,Npd	
where:	Srcid	Source identification code
	Srcrng	Range of sources (inclusive) for which scavenging coefficients apply
	Scavcoef	Scavenging coefficient $(s\text{-}mm/hr)^{-1}$ for frozen precipitation for each size category
GAS-SCAV	Srcid (or Srcrng) LIQ or ICE Scavcoef	
where:	Srcid	Source identification code
	Srcrng	Range of sources (inclusive) for which scavenging coefficent applies
	LIQ	Specifies that inputs are for liquid precipitation
	ICE	Specifies that inputs are for frozen precipitation
	Scavcoef	Scavenging coefficient $(s\text{-}mm/hr)^{-1}$ for liquid or frozen precipitation for each size category
HOUREMIS	Emifil Srcid's Srcrng's	
where:	Emifil	Specifies name of the hourly emission rate file
	Srcid's	Discrete source IDs that are included in the hourly emission file
	Srcrng's	Source ID ranges that are included in the hourly emission file
SRCGROUP	Grpid Srcid's Srcrng's	
where:	Grpid	Group ID (Grpid = ALL specifies group including all sources), number of source groups limited by NGRP parameter in the computer code
	Srcid's	Discrete source IDs to be included in group
	Srcrng's	Source ID ranges to be included in group
		Note: Card may be repeated with same Grpid if more space is needed to specify sources

DESCRIPTION OF RECEPTOR PATHWAY KEYWORDS

(APPLIES TO ISCST AND ISCLT)

RE Keywords	Type	Keyword Description
STARTING	M - N	Identifies the start of RECEPTOR pathway inputs
ELEVUNIT	O - N	Defines input units for receptor elevations (defaults to meters), must be first keyword after RE STARTING if used.
GRIDCART	O - R[1]	Defines a Cartesian grid receptor network
GRIDPOLR	O - R[1]	Defines a polar receptor network
DISCCART	O - R[1]	Defines the discretely placed rec eptor locations referenced to a Cartesian system
DISCPOLR	O - R[1]	Defines the discretely placed receptor locations referenced to a polar system
BOUNDARY	O - R[1]	Defines discrete polar receptor locations corresponding to minimum plant boundary distances for each 10 degree sector
BOUNDELV	O - R	Defines terrain elevations for discrete receptors specified with BOUNDARY keyword
FINISHED	M - N	Identifies the end of RECEPTOR pathway inputs

1) At least one of the following must be present: GRIDCART, GRIDPOLR, DISCCART, DISCPOLR, or BOUNDARY. Multiple receptor networks can be specified in a single run, including both Cartesian and polar, up to an overall maximum controlled by the NREC parameter.

Keyword	Parameters	
ELEVUNIT	METERS or FEET	
where:	METERS	Specifies input units for receptor elevations of meters
	FEET	Specifies input units for receptor elevations of feet Note: This keyword applies to receptor elevations only.
GRIDCART	Netid STA XYINC Xinit Xnum Xdelta Yinit Ynum Ydelta or XPNTS Gridx1 Gridx2 Gridx3 .... GridxN, and YPNTS Gridy1 Gridy2 Gridy3 .... GridyN ELEV Row Zelev1 Zelev2 Zelev3 ... ZelevN FLAG Row Zflag1 Zflag2 Zflag3 ... ZflagN END	
where:	Netid	Receptor network identification code (up to eight alphanumeric characters)
	STA	Indicates STArt of GRIDCART subpathway, repeat for each new Netid
	XYINC	Keyword identifying grid network generated from x and y increments
	Xinit	Starting x-axis grid location in meters
	Xnum	Number of x-axis receptors
	Xdelta	Spacing in meters between x-axis receptors
	Yinit	Starting y-axis grid location in meters
	Ynum	Number of y-axis receptors
	Ydelta	Spacing in meters between y-axis receptors
	XPNTS	Keyword identifying grid network defined by a series of x and y coordinates
		Value of first x-coordinate for Cartesian grid
	Gridx1	Value of 'nth' x-coordinate for Cartesian grid
	GridxN	Keyword identifying grid network defined by a series
	YPNTS	of x and y coordinates
		Value of first y-coordinate for Cartesian grid
	Gridy1	Value of 'nth' y-coordinate for Cartesian grid
	GridyN	Keyword to specify that receptor elevations follow
	ELEV	Indicates which row (y-coordinate fixed) is being input
	Row	An array of receptor terrain elevations for a particular Row
		Keyword to specify that flagpole receptor heights
	Zelev	follow
		Indicates which row (y-coordinate fixed) is being input
	FLAG	An array of receptor heights above local terrain
		elevation for a particular Row (flagpole receptors) Indicates END of GRIDCART subpathway, repeat for each
	Row	new Netid
	Zflag	
	END	

GRIDPOLR	Netid STA ORIG Xinit Yinit, or ORIG Srcid DIST Ring1 Ring2 Ring3 ... RingN DDIR Dir1 Dir2 Dir3 ... DirN, or GDIR Dirnum Dirini Dirinc ELEV Dir Zelev1 Zelev2 Zelev3 ... ZelevN FLAG Dir Zflag1 Zflag2 Zflag3 ... ZflagN END	
where:	Netid	Receptor network identification code (up to eight alphanumeric characters)
	STA	Indicates STArt of GRIDPOLR subpathway, repeat for each new Netid
	ORIG	Optional keyword to specify the origin of the polar network (assumed to be at x=0, y=0 if omitted)
	Xinit	x-coordinate for origin of polar network
	Yinit	y-coordinate for origin of polar network
	Srcid	Source ID of source used as origin of polar network
	DIST	Keyword to specify distances for the polar network
	Ring1	Distance to the first ring of polar coordinates
	RingN	Distance to the 'nth' ring of polar coordinates
	DDIR	Keyword to specify discrete direction radials for the polar network
	Dir1	First direction radial in degrees (1 to 360)
	DirN	The 'nth' direction radial in degrees (1 to 360)
	GDIR	Keyword to specify generated direction radials for the polar network
	Dirnum	Number of directions used to define the polar system
	Dirini	Starting direction of the polar system
	Dirinc	Increment (in degrees) for defining directions
	ELEV	Keyword to specify that rec eptor elevations follow
	Dir	Indicates which direction is being input
	Zelev	An array of receptor terrain elevations for a particular direction radial
	FLAG	Keyword to specify that flagpole receptor heights follow
	Dir	Indicates which direction is being input
	Zflag	An array of receptor heights above local terrain elevation for a particular direction (flagpole receptors)
	END	Indicates END of GRIDPOLR subpathway, repeat for each new Netid

DESCRIPTION OF RECEPTOR PATHWAY KEYWORDS AND PARAMETERS

(APPLIES TO ISCST AND ISCLT)

DISCCART	Xcoord Ycoord (Zelev) (Zflag)	
where:	Xcoord	x-coordinate for discrete receptor location
	Ycoord	y-coordinate for discrete receptor location
	Zelev	Elevation above sea level for discrete receptor location (optional), used only for ELEV terrain
	Zflag	Receptor height (flagpole) above local terrain (optional), used only with FLAGPOLE keyword
DISCPOLR	Srcid Dist Direct (Zelev) (Zflag)	
where:	Srcid	Specifies source identification for which discrete polar receptor locations apply (used to define the origin for the discrete polar receptor)
	Dist	Downwind distance to receptor location
	Direct	Direction to receptor location, in degrees clockwise from North
	Zelev	Elevation above sea level for receptor location (optional), used only for ELEV terrain
	Zflag	Receptor height (flagpole) above local terrain (optional), used only with FLAGPOLE keyword
BOUNDARY	Srcid Dist(i), i=1,36	
where:	Srcid	Specifies source identification for which boundary distances apply
	Dist	Array of 36 values corresponding to minimum plant boundary distances for every 10-degree sector, beginning with the 10 degree flow vector Note: Discrete receptor coordinates are generated with an origin referenced to the location of the source identified with Srcid
BOUNDELV	Srcid Zelev(i), i=1,36	
where:	Srcid	Specifies source identification for which boundary distances apply
	Zelev	Array of 36 values corresponding to terrain elevation for plant boundary distances for 10-degree sectors, beginning with the 10 degree flow vector

DESCRIPTION OF METEOROLOGY PATHWAY KEYWORDS

ME Keywords	Type	Keyword Description
STARTING	M - N	Identifies the start of METEOROLOGY pathway inputs
INPUTFIL	M - N	Describes input meteorological data file
ANEMHGHT	M - N	Input height of anemometer above stack base
SURFDATA	M - N	Describes surface meteorological station
UAIRDATA	M - N	Describes upper air meteorological station
STARTEND	O - N	Specifies start and end dates to be read from input meteorological data file (default is to read entire file). (Applies to ISCST Only)
DAYRANGE	O - R	Specifies days or ranges of days to process (default is to process all data read in). (Applies to ISCST Only)
WDROTATE	O - N	May be used to correct for alignment problems of wind direction measurements, or to convert wind direction from to flow vector
WINDPROF	O - R	Input optional wind profile exponents
DTHETADZ	O - R	Input optional vertical potential temperature gradients
WINDCATS	O - N	Input upper bounds of wind speed categories, five values input - sixth category is assumed to have no upper bound. (Applies to Short Term Only)
AVESPEED	O - N	Average (median) wind speed for each speed category in the STAR summary. (Applies to ISCLT Only)
AVETEMPS	M - R	Average ambient temperatures for each stability category and season. (Applies to ISCLT Only)
AVEMIXHT	M - R	Average mixing heights for each wind speed, stability category and season. (Applies to ISCLT Only)
AVEROUGH	O - R	Roughness length for each season (Applies to ISCLT Only)
FINISHED	M - N	Identifies the end of METEOROLOGY pathway inputs

DESCRIPTION OF METEOROLOGY PATHWAY KEYWORDS AND PARAMETERS

Keyword	Parameters	
INPUTFIL	Metfil (Format)	
where:	Metfil	Specify filename for meteorological input file
	Format	Specify format for input file: options are to provide FORTRAN read format for ASCII file, (YR,MN,DY,HR,AFV (or WD),WS,TA,KST,ZIRUR,ZIURB); use default ASCII format (4I2,2F9.4,F6.1,I2,2F7.1) if blank; use free format if FREE; use default ASCII format with hourly WINDPROF and DTHETADZ if CARD ; or use unformatted PCRAMMET file if UNFORM
ANEMHGHT	Zref (Zrunit)	
where:	Zref	Reference (anemometer) height above ground for wind speed measurement; also assumed to be height above stack base
	Zrunit	Units of Zref: METERS or FEET (default is METERS)
SURFDATA	Stanum Year (Name) (Xcoord Ycoord)	
where:	Stanum	Station number, e.g. 5-digit WBAN number for NWS surface station
	Year	Year of data being processed (four digits)
	Name	Station name (optional)
	Xcoord	x-coordinate of station location (m) (optional)
	Ycoord	y-coordinate of station location (m) (optional)
UAIRDATA	Stanum Year (Name) (Xcoord Ycoord)	
where:	Stanum	Station number, e.g. 5-digit WBAN number for NWS upper air station
	Year	Year of data being processed (four digits)
	Name	Station name (optional)
	Xcoord	x-coordinate of station location (m) (optional)
	Ycoord	y-coordinate of station location (m) (optional)
STARTEND	Strtyr Strtmn Strtdy (Strthr) Endyr Endmn Enddy (Endhr) (Applies to ISCST Only)	
where:	Strtyr	Year of first record to be read
	Strtmn	Month of first record to be read
	Strtdy	Day of first record to be read
	Strthr	Hour of first record to be read (optional)
	Endyr	Year of last record to be read
	Endmn	Month of last record to be read
	Enddy	Day of last record to be read
	Endhr	Hour of last record to be read (optional) Note: File read begins with hour 1 of the start date and ends with hour 24 of the end date if Stahr and Endhr are omitted.

DAYRANGE	Range1 Range2 Range3 ... RangeN (Applies to ISCST Only)	
where:	Range1	First range of days to process, either as individual day (XXX) or as range (XXX-YYY); days may be input as Julian dates (XXX) or as month and day (XX/YY)
	RangeN	The 'nth' range of days to process
STARDATA	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC (ISCLT Model) WINTER SPRING SUMMER FALL or QUART1 QUART2 QUART3 QUART4 MONTH SEASON QUARTR ANNUAL	
where:	JAN	Option to calculate JANuary averages from STAR data
	FEB	Option to calculate FEBruary averages from STAR data
	DEC	Option to calculate DECember averages from STAR data
	WINTER	Option to calculate WINTER averages from STAR data
	SPRING	Option to calculate SPRING averages from STAR data
	SUMMER	Option to calculate SUMMER averages from STAR data
	FALL	Option to calculate FALL averages from STAR data
	QUART1	Option to calculate QUART1 averages from STAR data
	QUART2	Option to calculate QUART2 averages from STAR data
	QUART3	Option to calculate QUART3 averages from STAR data
	QUART4	Option to calculate QUART4 averages from STAR data
	MONTH	Option to calculate averages for all twelve MONTHs
	SEASON	Option to calculate averages for all four SEASONs
	QUARTR	Option to calculate averages for all four QUARTeRs
	ANNUAL	Option to calculate annual values from an ANNUAL STAR summary
	PERIOD	Option to calculate averages for the entire data PERIOD

WDROTATE	Rotang	
where:	Rotang	Specifies angle (in degrees) to rotate wind direction measurements to correct for alignment problems; value of Rotang is subtracted from WD measurements, i.e., rotation is counterclockwise; may also be used to adjust input of wind direction from values to flow vector values by setting Rotang = 180
WINDPROF	Stab Prof1 Prof2 Prof3 Prof4 Prof5 Prof6	
where:	Stab	Specifies stability category (A through F) for the following six values by wind speed class
	Prof1	Wind speed profile exponent for first speed class
	Prof2	Wind speed profile exponent for second speed class
	Prof3	Wind speed profile exponent for third speed class
	Prof4	Wind speed profile exponent for fourth speed class
	Prof5	Wind speed profile exponent for fifth speed class
	Prof6	Wind speed profile exponent for sixth speed class
		Note: Card is repeated for each stability class
DTHETADZ	Stab Dtdz1 Dtdz2 Dtdz3 Dtdz4 Dtdz5 Dtdz6	
where:	Stab	Specifies stability category (A through F) for the following six values by wind speed class
	Dtdz1	Vertical temperature gradient for first speed class
	Dtdz2	Vertical temperature gradient for second speed class
	Dtdz3	Vertical temperature gradient for third speed class
	Dtdz4	Vertical temperature gradient for fourth speed class
	Dtdz5	Vertical temperature gradient for fifth speed class
	Dtdz6	Vertical temperature gradient for sixth speed class
		Note: Card is repeated for each stability class

WINDCATS	Ws1 Ws2 Ws3 Ws4 Ws5 (Applies to Short Term Only)	
where:	Ws1	Upper bound of first wind speed category (m/s)
	Ws2	Upper bound of second wind speed category (m/s)
	Ws3	Upper bound of third wind speed category (m/s)
	Ws4	Upper bound of fourth wind speed category (m/s)
	Ws5	Upper bound of fifth wind speed category (m/s) (sixth category is assumed to have no upper bound)
AVESPEED	Ws1 Ws2 Ws3 Ws4 Ws5 Ws6 (Applies to ISCLT Only)	
where:	Ws1	Median speed of first wind speed category (m/s)
	Ws2	Median speed of second wind speed category (m/s)
	Ws3	Median speed of third wind speed category (m/s)
	Ws4	Median speed of fourth wind speed category (m/s)
	Ws5	Median speed of fifth wind speed category (m/s)
	Ws6	Median speed of sixth wind speed category (m/s)
AVETEMPS	Aveper Ta1 Ta2 Ta3 Ta4 Ta5 Ta6 (Applies to ISCLT Only)	
where:	Aveper	Specifies averaging period (see AVERTIME keyword) for the following temperatures (K)
	Ta1	Average temperature of stability category A
	Ta2	Average temperature of stability category B
	Ta3	Average temperature of stability category C
	Ta4	Average temperature of stability category D
	Ta5	Average temperature of stability category E
	Ta6	Average temperature of stability category F Note: Card is repeated for each averaging period
AVEMIXHT	Aveper Stab Mixht1 Mixht2 Mixht3 Mixht4 Mixht5 Mixht6 (Applies to ISCLT Only)	
where:	Aveper	Specifies averaging period (see AVERTIME keyword) for the following mixing heights (m)
	Stab	Specifies stability category (A through F) for the following six values by wind speed class
	Mixht1	Average mixing height for first speed class
	Mixht2	Average mixing height for second speed class
	Mixht3	Average mixing height for third speed class
	Mixht4	Average mixing height for fourth speed class
	Mixht5	Average mixing height for fifth speed class
	Mixht6	Average mixing height for sixth speed class Note: Card is repeated for each stability class and for each averaging period
AVEROUGH	Aveper Z0 (Applies to ISCLT Only)	
where:	Aveper	Specifies averaging period (AVERTIME keyword) for the roughness length (m)
	Z0	Roughness Length Note: Card is repeated for each averaging period

DESCRIPTION OF TERRAIN GRID PATHWAY KEYWORDS

TG Keywords	Type	Keyword Description
STARTING	M - N	Identifies the start of TERRAIN GRID pathway inputs
INPUTFIL	M - N	Describes input terrain grid data file
LOCATION	M - N	Specifies the origin of the terrain grid
ELEVUNIT	O - N	Defines input units for terrain grid elevations (defaults to meters)
FINISHED	M - N	Identifies the end of TERRAIN GRID pathway inputs

Note: The Terrain Grid (TG) pathway is optional. The TG pathway is only used for calculating dry depletion in elevated or complex terrain. If it is omitted, then the terrain profile is linearly interpolated along the plume path from source to receptor for dry depletion calculations.

DESCRIPTION OF TERRAIN GRID PATHWAY KEYWORDS AND PARAMETERS

INPUTFIL	Tgfile	
where:	Tgfile	Specifies filename for the terrain grid data file
LOCATION	Xorig Yorig (Units)	
where:	Xorig Yorig Units	UTM X-coordinate of origin for the source and receptor locations UTM Y-coordinate of origin for the source and receptor locations Units for Xorig and Yorig (FEET, KM, or METERS - default is in METERS)
ELEVUNIT	METERS or FEET	
where:	METERS FEET	Specifies input units for terrain grid elevations of meters Specifies input units for terrain grid elevations of feet Note: This keyword applies to terrain grid elevations only.

DESCRIPTION OF EVENT PATHWAY KEYWORDS

(APPLIES TO ISCEV MODEL ONLY)

EV Keywords	Type	Keyword Description
STARTING	M -N	Identifies the start of EVENT pathway inputs
EVENTPER	M -R	Describes data and averaging period for an event
EVENTLOC	M -R	Describes receptor location for an event
FINISHED	M -N	Identifies the end of EVENT pathway inputs

DESCRIPTION OF EVENT PATHWAY KEYWORDS AND PARAMETERS

(APPLIES TO ISCEV MODEL ONLY)

Keyword	Parameters	
EVENTPER	Evname Aveper Grpid Date	
where:	Name	Specify name of event to be processed (e.g. H2H24ALL), (up to eight alphanumeric characters)
	Grpid	Specify source group ID for event
	Aveper	Specify averaging period for event
	Date	Specify data period for event (ending YYMMDDHH for averaging period)
EVENTLOC	Evname XR= Xr YR= Yr (Zelev) (Zflag) or RNG= Rng DIR= Dir (Zelev) (Zflag)	
where:	Evname	Specify name of event to be processed (e.g. H2H24ALL), (up to eight alphanumeric characters)
	XR=	X-coordinate for event (discrete Cartesian receptor)
	YR=	Y-coordinate for event (discrete Cartesian receptor)
	RNG=	Distance range for event (discrete polar receptor)
	DIR=	Radial direction for event (discrete polar receptor)
	Zelev	Terrain elevation for event (optional)
	Zflag	Receptor height above ground for event (optional)

Note: EVENT locations can be input as either discrete Cartesian receptors (XR=, YR=) or as discrete polar receptors (RNG=, DIR=). Events that are specified in the file generated by the ISCST model (CO EVENTFIL card) are always given as discrete Cartesian coordinates. Discrete polar receptors are assumed to be relative to an origin of (0,0).

DESCRIPTION OF OUTPUT PATHWAY KEYWORDS

OU Keywords	Type	Keyword Description
STARTING	M - N	Identifies the start of OUTPUT pathway inputs
RECTABLE	O - R	Option to specify value(s) by receptor for output
MAXTABLE	O - R	Option to summarize the overall maximum values
DAYTABLE	O - N	Option to print summaries for each averaging period for each day processed. (Applies to ISCST Only)
MAXIFILE	O - R	Option to list events exceeding a threshold value to file (if CO EVENTFIL option is used, these events are included in the input file generated for the EVENT model). (Applies to ISCST Only)
POSTFILE[1]	O - R	Option to write results to a mass storage file for postprocessing. (Applies to ISCST Only)
PLOTFILE[1]	O - R	Option to write certain results to a storage file suitable for input to plotting routines
TOXXFILE	O - R	Option to write results to a storage file suitable for input to the TOXX model component of TOXST or the RISK model component of TOXLT
EVENTOUT[2]	M - N	Specifies the level of output information provided by the EVENT model. (Applies to ISCEV Only)
FINISHED	M - N	Identifies the end of OUTPUT pathway inputs

1) POSTFILE is used to output concurrent concentration values for particular source groups and averaging times across the receptor network, suitable for postprocessing, such as might be done for implementing the intermediate terrain policy. PLOTFILE is used to output specific design values, such as second high concentrations, across the receptor network, suitable for plotting concentration contours.

2) EVENTOUT is the only keyword on the OU pathway for the Short Term EVENT model.

DESCRIPTION OF OUTPUT PATHWAY KEYWORDS AND PARAMETERS

Keyword	Parameters	
RECTABLE	Aveper FIRST SECOND . . . SIXTH (Short Term Model) or Aveper 1ST 2ND . . . 6TH (Short Term Model) INDSRC and/or SRCGRP (Long Term Model)	
where:	Aveper	Averaging period to summarize with high values (keyword ALLAVE specifies all averaging periods)
	FIRST	Select summaries of FIRST highest values by receptor
	SECOND	Select summaries of SECOND highest values by receptor
	SIXTH	Select summaries of SIXTH highest values by receptor
	1ST	Select summaries of 1ST highest values by receptor
	2ND	Select summaries of 2ND highest values by receptor
	6TH	Select summaries of 6TH highest values by receptor
		Note: If two keywords are input separated by a dash (e.g. FIRST -THIRD), then summaries of all high values in that range are provided. The number of high values allowed is controlled by the NVAL parameter in the computer code (initially set at 3). Also, if the CO EVENTFIL keyword is exercised, then the events generated by the RECTABLE keyword are included in the input file for EVENT model.
	INDSRC	Specifies that summaries of individual source values for each receptor point will be provided
	SRCGRP	Specifies that summaries of source group values for each receptor point will be provided Note: Either INDSRC or SRCGRP or both may be specified
MAXTABLE	Aveper Maxnum (Short Term Model) Maxnum INDSRC and/or SRCGRP and/or SOCONT (Long Term Model)	
where:	Aveper	Averaging period to summarize with maximum values (keyword ALLAVE specifies all averaging periods)
	Maxnum	Specifies number of overall maximum values to summarize (number of maximum values permitted is limited by the NMAX parameter in the computer code, initially set at 50 for Short Term and 10 for Long Term)
	INDSRC	Specifies that summaries of maximum values for individual sources will be provided (independent of source group maxima)
	SRCGRP	Specifies that summaries of maximum values by source group will be provided
	SOCONT	Specifies that summaries of individual source contributions for locations of maximum source group values will be provided Note: Any combination of Long Term parameters is acceptable

DESCRIPTION OF OUTPUT PATHWAY KEYWORDS AND PARAMETERS

DAYTABLE	Avper1 Avper2 Avper3 . . . (Applies to ISCST Only)	
where:	Avper1	Averaging period to summarize with values by receptor for each day of data processed (keyword ALLAVE for first parameter specifies all averaging periods)
MAXIFILE	Aveper Grpid Thresh Filnam (Funit) (Applies to ISCST Only)	
where:	Aveper	Specifies averaging period for list of values equal to or exceeding a threshold value
	Grpid	Specifies source group to be output to file
	Thresh	Threshold value (e.g. NAAQS) for list of exceedances
	Filnam	Name of disk file to store maximum values
	Funit	Optional parameter to specify the file unit Note: If the CO EVENTFIL keyword is exercised, then the events generated by the MAXIFILE keyword are included in the input file for the EVENT model.
POSTFILE	Aveper Grpid Format Filnam (Funit) (Applies to ISCST Only)	
where:	Aveper	Specifies averaging period to be output to file, e.g., 24 for 24-hr averages, PERIOD for period averages
	Grpid	Specifies source group to be output to file
	Format	Specifies format of file, either UNFORM for unformatted files or PLOT for formatted files for plotting
	Filnam	Specifies filename for output file
	Funit	Optional parameter to specify the file unit
PLOTFILE	Aveper Grpid Hivalu Filnam (Funit) (ISCST short term values) Aveper Grpid Filnam (Funit) (ISCLT model and ISCST PERIOD averages)	

where:	Aveper	Specifies averaging period to be output to file, e.g., 24 for 24-hr averages, PERIOD for period averages, WINTER for winter averages, etc.
	Grpid	Specifies source group to be output to file
	Hivalu	Specifies high value summary (e.g. FIRST, SECOND, 1ST, 2ND, etc.) to be output to file (must be selected on a RECTABLE card)
	Filnam	Specifies filename for output file
	Funit	Optional parameter to specify the file unit
TOXXFILE	Aveper Cutoff Filnam (Funit) (ISCST short term values) Aveper Grpid Filnam (Funit) (ISCLT model)	
where:	Aveper	Specifies averaging period to be output to file, e.g., 1 for 1-hr averages, PERIOD for period averages (LT only), WINTER for winter averages, etc.
	Cutoff	Specifies cutoff (threshold) value in g/m^3 for outputting results for ISCST model
	Grpid	Specifies source group to be output to file (LT only)
	Filnam	Specifies filename for output file
	Funit	Optional parameter to specify the file unit
EVENTOUT	SOCONT or DETAIL (Applies to ISCEV Only)	
where:	SOCONT	Specifies the option to provide source contribution information only in the event output
	DETAIL	Specifies the option to include hourly concentrations for each source and hourly meteorological data in the event output

Appendix G

List of Risk Assessment Reports Created by

The “Full Standard Report Set” Button on Risk Reports Window

Appendix G
List of Risk Assessment Reports Created by
The "Full Standard Report Set" button on Risk Reports Window

Some facility risk assessments are required to be reviewed by the Office of Environmental Health Hazard Assessment (OEHHA) for approval. The OEHHA Risk Assessment Guidance Manual requires a specific set of files be sent to OEHHA for their review. For your convenience, a button has been added to the *Risk Reports Window* in the Risk Analysis Module that will generate all of the required reports at one time. Below is a list of the reports that HARP will create.

Report 1: Rep01_Can_70yr_AllOEH_AllRec_AllSrc_AllCh_ByRec_Site_UTM.txt

Health effect:	Cancer Risk
Exposure duration:	70 year (adult resident)
Analysis method:	Average, High-end and Derived (OEHHA) Method
Receptor(s):	All
Sources(s):	All
Chemicals(s):	All
Report:	By Receptor
	Include site-specific parameter report
	Include UTM coordinates

Report 2: Rep02_Can_70yr_AllOEH_AllRec_AllSrc_AllCh_ByRec_ByChem_Site_UTM.txt

Health effect:	Cancer Risk
Exposure duration:	70 year (adult resident)
Analysis method:	Average, High-end and Derived (OEHHA) Method
Receptor(s):	All
Sources(s):	All
Chemicals(s):	All
Report:	By Receptor
	By Chemical
	Include site-specific parameter report
	Include UTM coordinates

Report 3: Rep03_Can_70yr_AllOEH_AllRec_AllSrc_AllCh_ByRec_ByChem_DosePath_Site_UTM.txt

Health effect:	Cancer Risk
Exposure duration:	70 year (adult resident)
Analysis method:	Average, High-end and Derived (OEHHA) Method
Receptor(s):	All
Sources(s):	All
Chemicals(s):	All
Report:	By Receptor
	By Chemical
	Dose by Pathway
	Include site-specific parameter report
	Include UTM coordinates

Report 4: Rep04_Chr_Res_DerOEH_AllRec_AllSrc_AllCh_ByRec_Site_UTM.txt

Health effect:	Chronic HI
Exposure duration:	resident
Analysis method:	Derived (OEHHA) Method
Receptor(s):	All
Sources(s):	All
Chemicals(s):	All
Report:	By Receptor
	Include site-specific parameter report
	Include UTM coordinates

Report 5: Rep05_Chr_Res_DerOEH_AllRec_AllSrc_AllCh_ByRec_ByChem_Site_UTM.txt

Health effect:	Chronic HI
Exposure duration:	resident
Analysis method:	Derived (OEHHA) Method
Receptor(s):	All
Sources(s):	All
Chemicals(s):	All
Report:	By Receptor
	By Chemical
	Include site-specific parameter report
	Include UTM coordinates

Report 6: Rep06_Chr_Res_DerOEH_AllRec_AllSrc_AllCh_ByRec_ByChem_DosePath_Site_UTM.txt

Health effect:	Chronic HI
Exposure duration:	resident
Analysis method:	Derived (OEHHA) Method
Receptor(s):	All
Sources(s):	All
Chemicals(s):	All
Report:	By Receptor
	By Chemical
	Dose by Pathway
	Include site-specific parameter report
	Include UTM coordinates

Report 7: Rep07_Acu_AllRec_AllSrc_AllCh_ByRec_Site_UTM.txt

Health effect:	Acute HI Simple (Concurrent Max.)
Analysis method:	Point Estimate
Receptor(s):	All
Sources(s):	All
Chemicals(s):	All
Report:	By Receptor
	Include site-specific parameter report
	Include UTM coordinates

Report 8: Rep08_Acu_AllRec_AllSrc_AllCh_ByRec_ByChem_Site_UTM.txt

Health effect:	Acute HI Simple (Concurrent Max.)
Analysis method:	Point Estimate
Receptor(s):	All
Sources(s):	All
Chemicals(s):	All
Report:	By Receptor
	By Chemical
	Include site-specific parameter report
	Include UTM coordinates

Report 9: Rep09_Can_70yr_AllOEH_Rec2_AllSrc_AllCh_ByRec_ByChem_DosePath_Site_UTM.txt

Health effect:	Cancer Risk
Exposure duration:	70 year (adult resident)
Analysis method:	Average, High-end and Derived (OEHHA) Method
Receptor number:	2 (Receptor number is chosen by user)
Sources(s):	All
Chemicals(s):	All
Report:	By Receptor
	By Chemical
	Dose by Pathway
	Include site-specific parameter report
	Include UTM coordinates

Report 10: Rep10_Chr_Res_DerOEH_Rec2_AllSrc_AllCh_ByRec_ByChem_DosePath_Site_UTM.txt

Health effect:	Chronic HI
Exposure duration:	resident
Analysis method:	Derived (OEHHA) Method
Receptor number:	2 (Receptor number is chosen by user)
Sources(s):	All
Chemicals(s):	All
Report:	By Receptor
	By Chemical
	Dose by Pathway
	Include site-specific parameter report
	Include UTM coordinates

Report 11: Rep11_Acu_Rec1_AllSrc_AllCh_ByRec_ByChem_Site_UTM.txt

Health effect:	Acute HI Simple (Concurrent Max.)
Analysis method:	Point Estimate
Receptor number:	1 (Receptor number is chosen by user)
Sources(s):	All
Chemicals(s):	All
Report:	By Receptor
	By Chemical
	Include site-specific parameter report
	Include UTM coordinates

Report 12: Rep12_Can_40yr_AllOEH_AllRec_AllSrc_AllCh_ByRec_ByChem_DosePath_Site_UTM.txt

Health effect:	Cancer Risk
Exposure duration:	40 year (worker)
Analysis method:	Average, High-end and Derived (OEHHA) Method
Receptor(s):	All
Sources(s):	All
Chemicals(s):	All
Report:	By Receptor
	By Chemical
	Dose by Pathway
	Include site-specific parameter report
	Include UTM coordinates

Report 13: Rep13_Chr_Wrk_PtEst_AllRec_AllSrc_AllCh_ByRec_ByChem_DosePath_Site_UTM.txt

Health effect:	Chronic HI
Exposure duration:	worker
Analysis method:	Point estimate
Receptor(s):	All
Sources(s):	All
Chemicals(s):	All
Report:	By Receptor
	By Chemical
	Dose by Pathway
	Include site-specific parameter report
	Include UTM coordinates

Report 14: Rep14_Can_30yr_AllOEH_AllRec_AllSrc_AllCh_ByRec_ByChem_DosePath_Site_UTM.txt

Health effect:	Cancer Risk
Exposure duration:	30 year (adult resident)
Analysis method:	Average, High-end and Derived (OEHHA) Method
Receptor(s):	All
Sources(s):	All
Chemicals(s):	All
Report:	By Receptor
	By Chemical
	Dose by Pathway
	Include site-specific parameter report
	Include UTM coordinates

Report 15: Rep15_Can_9yrA_AllOEH_AllRec_AllSrc_AllCh_ByRec_ByChem_DosePath_Site_UTM.txt

Health effect:	Cancer Risk
Exposure duration:	9 year (adult resident)
Analysis method:	Average, High-end and Derived (OEHHA) Method
Receptor(s):	All
Sources(s):	All
Chemicals(s):	All
Report:	By Receptor
	By Chemical
	Dose by Pathway
	Include site-specific parameter report
	Include UTM coordinates

Report 16: Rep16_Can_9yrC_AllOEH_AllRec_AllSrc_AllCh_ByRec_ByChem_DosePath_Site_UTM.txt

Health effect:	Cancer Risk
Exposure duration:	9 year (child resident)
Analysis method:	Average, High-end and Derived (OEHHA) Method
Receptor(s):	All
Sources(s):	All
Chemicals(s):	All
Report:	By Receptor
	By Chemical
	Dose by Pathway
	Include site-specific parameter report
	Include UTM coordinates

Report 17: Rep17_Can_70yr_DerAdj_AllRec_AllSrc_AllCh_ByRec_ByChem_DosePath_Site_UTM.txt

Health effect:	Cancer Risk
Exposure duration:	70 year (adult resident)
Analysis method:	Derived (Adjusted) Method
Receptor(s):	All
Sources(s):	All
Chemicals(s):	All
Report:	By Receptor
	By Chemical
	Dose by Pathway
	Include site-specific parameter report
	Include UTM coordinates

Report 18: Rep18_Can_70yr_Inh_AllRec_AllSrc_AllCh_ByRec_ByChem_DosePath_Site_UTM.txt

Health effect:	Cancer Risk
Exposure duration:	70 year (adult resident)
Analysis method:	80th Percentile Point Estimate (inhalation pathway only)
Receptor(s):	All
Sources(s):	All
Chemicals(s):	All
Report:	By Receptor
	By Chemical
	Dose by Pathway
	Include site-specific parameter report
	Include UTM coordinates

Report 19: Rep19_Can_70yr_AllAdj_AllRec_AllSrc_AllCh_ByRec_ByChem_DosePath_Site_UTM.txt

Health effect:	Cancer Risk
Exposure duration:	70 year (adult resident)
Analysis method:	Average, Adjusted (inhalation)/High-end, and Derived (Adjusted) Method
Receptor(s):	All
Sources(s):	All
Chemicals(s):	All
Report:	By Receptor
	By Chemical
	Dose by Pathway
	Include site-specific parameter report
	Include UTM coordinates

Report 20: REP20_PMI_70yr.txt
Receptors with highest cancer risk
Receptors with highest chronic Hazard Index
Receptors with highest acute Hazard Index

Report 21: Rep21_ExceptionReport.txt
Lists all non-default changes that are made to the network

Appendix H

Recommendations for Estimating Concentrations of Longer Averaging Periods from the Maximum One-Hour Concentration for Screening Purposes

Appendix H

Recommendations for Estimating Concentrations of Longer Averaging Periods from the Maximum One-Hour Concentration for Screening Purposes

A. Introduction

The U.S. Environmental Protection Agency (U.S. EPA) SCREEN3 air dispersion model is frequently used to estimate the maximum one-hour concentration downwind due to emissions from a point source to assess impacts from a source. The SCREEN3 model results (or ISCST3 with screening meteorological data), in conjunction with the U.S. EPA screening factors, are frequently used to estimate concentrations for longer averaging periods, such as the maximum annual average concentration. In addition, it is permissible to use the ISCST3 air dispersion model in a screening mode with identical meteorological conditions as used in the SCREEN3 model to superimpose results from multiple sources.

This method to assess short-term and long-term impacts may be used as a first-level screening indicator to determine if a more refined analysis is necessary. In the event that representative meteorological data are not available, the screening assessment may be the only computer modeling method available to assess source impacts.

In California, this standard procedure will generally bias concentrations towards overprediction in most cases when the source is a continuous release. However, in the case when a source is not continuous, these screening factors may not be biased towards overprediction. In this case, we recommend an alternative procedure for estimating screening value concentrations for longer averaging periods than one-hour for intermittent releases.

B. Current Procedures

The current screening factors used to estimate longer term averages (i.e., 3-hour, 8-hour, 24-hour, 30-day, and annual averages) from maximum one-hour concentrations in California are shown in Table H.1 and Figure H.1. The factors are U.S. EPA recommended values with the exception of the 30-day factor. The 30-day factor is an ARB recommended value (ARB, 1994). The maximum and minimum values are recommended limits to which one may diverge from the general (Rec.) case, (U.S. EPA, 1992). Diverging from the general case should only be done on a case by case basis with prior approval from the reviewing agency.

C. Non-Standard Averaging Periods with a Continuous Release

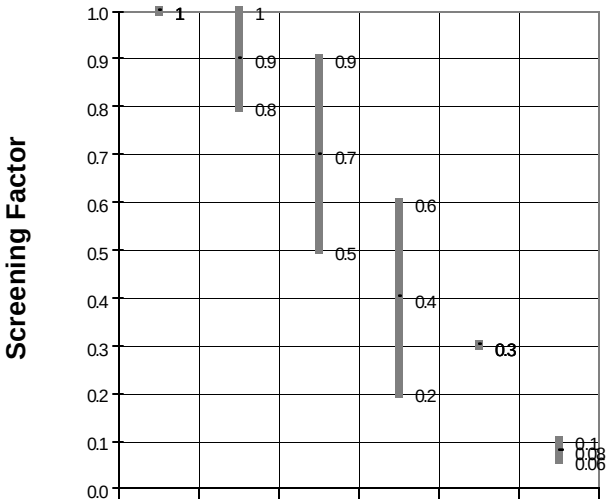
The following is the ARB recommendation for estimating screening concentrations for non-standard averaging periods that are not listed in Table H.1 or Figure H.1. Specifically, the recommendation is for estimating screening concentrations for 4-hour, 6-hour, and 7-hour averaging periods.

The current U.S. EPA screening factors applicable to standard averaging periods should be used for non-standard averaging periods. Specifically for the 4-hour, 6-hour, and 7-hour averaging periods, we recommend that the 3-hour screening factor of (0.9± 0.1) be used. The following illustrates the method to estimate a 6-hour average concentration from a continuous release from a single point source:

1. determine the maximum 1-hour concentration according to standard screening procedures ($C_{max1-hr}$),
2. scale the maximum 1-hour concentration by (0.9±0.1), and
3. the result is the maximum 6-hour concentration ($C_{max6-hr}=C_{max1-hr}$ *(0.9±0.1)).

In the case for the 6-hour and 7-hour average concentration estimates, the user may wish to take the lower bound of (0.9±0.1), or 0.8. For the 4-hour average estimate, we recommend the user to use the 3-hour factor as is, 0.9.

Figure H.1
Screening Factors to Convert
1-hr Max. to Longer Avg. Periods



	1-hr	3-hr	8-hr	24-hr	30-day	Annual
Max	1	1	0.9	0.6	0.3	0.1
Min	1	0.8	0.5	0.2	0.3	0.06
Rec	1	0.9	0.7	0.4	0.3	0.08

Averaging Period

Table H.1 Recommended Factors to Convert Maximum 1-hour Avg. Concentrations to Other Averaging Periods (U.S. EPA, 1992; ARB, 1994).

Averaging Time	Range	Typical Recommended
3 hours	0.8 - 1.0	0.9
8 hours	0.5 - 0.9	0.7
24 hours	0.2 - 0.6	0.4
30 days	0.2 - 0.3	0.3
Annual	0.06 - 0.1	0.08

Table H.2 summarizes these recommendations for the non-standard averaging periods.

Table H.2 Recommended Factors to Convert Maximum 1-hour Avg. Concentrations to Non-Standard Averaging Periods.

Averaging Time	Range	Typical Recommended
4 hours	0.8 - 1.0	0.9
6 hours	0.8 – 1.0	0.8
7 hours	0.8 – 1.0	0.8

D. Definitions

It is convenient to define the following terms relating to sources with respect to the duration of the release.

- Continuous Release – this is a release that is continuous over the duration of a year. An example of this type of release would be fugitive emissions from a 24-hour per day, 7-day per week operation or an operation that is nearly continuous.

- Intermittent Release – many emissions fall under this category. These are emission types that are not continuous over the year. Any operation that has normal business hours (e.g., 8 am to 6 pm) would fall into this category.

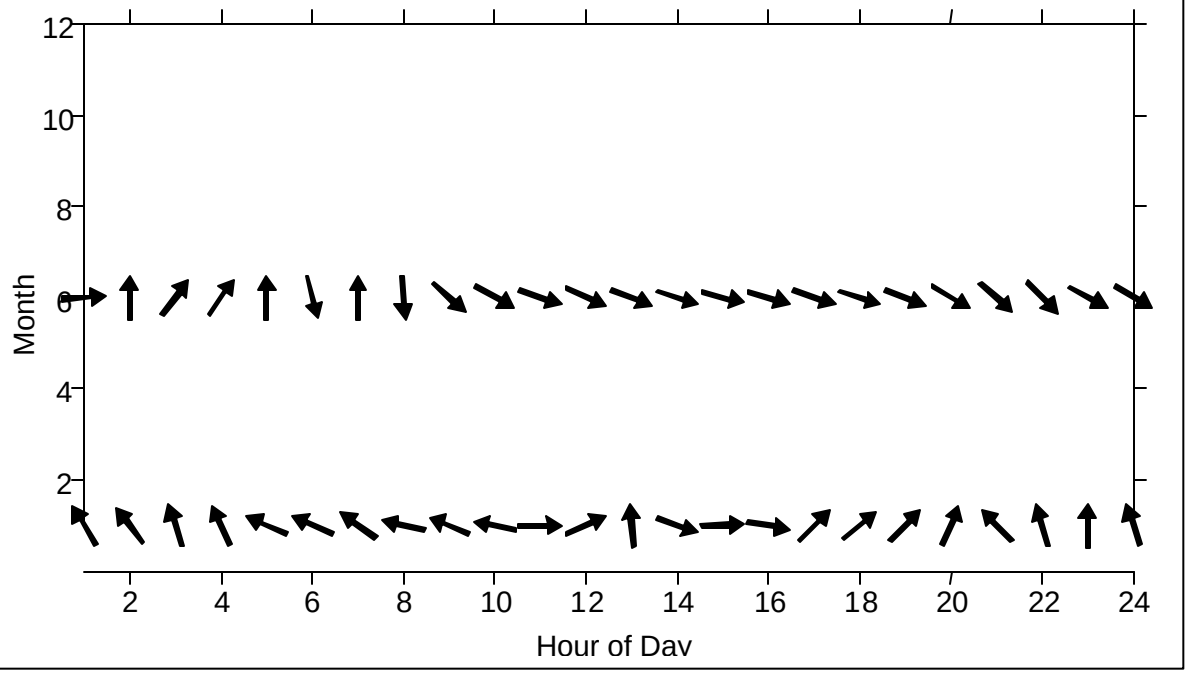
- Systematic Release – these are intermittent releases that occur at a specific time of the day. As an example, these type of releases can occur when a process requires clean out at the end of the work day. Thereby releasing emissions only at the end of the workday systematically. Systematic releases are similar to intermittent releases with a shorter duration during the normal operating schedule.

- Random Release – these are intermittent releases that can occur any time during the operating schedule. An example of this type of release would be of the type that depends on batch processing. For example, a brake shop may emit pollutants only when the brakes are cleaned which happens randomly throughout the normal business hours.

E. Screening Factors

The U.S. EPA screening factors, as shown in Table H.1, compensate for the effects of varying conditions of wind speed, wind direction, ambient temperature, atmospheric stability, and mixing height over longer averaging periods, even though it is not explicitly indicated in the U.S. EPA Guidance (U.S. EPA, 1992). Figure H.2 shows the variability in wind direction over a 24-hour period. The data are averaged for two seven-day periods from data collected at Los Angeles International Airport (LAX). Figure H.2 was compiled for data collected in 1989 for January 1 to January 7 and June1 through June 7, 1989. The ordinate in Figure H.2 shows the months of the year. Only two months are plotted. The abscissa shows the hour of the day.

Figure H.2
Hourly Wind Direction - Los Angeles
January (bottom – 1) and June (top - 6)



As seen in Figure H.2, the wind direction changes throughout all hours of the day. In addition, the wind direction for LAX, in the overnight and early morning hours, can vary from January to June. During the afternoon hours of 1400 – 1600, the wind direction is similar in both months of January and June.

The standard U.S. EPA screening factor to estimate the maximum 24-hour concentration from the maximum 1-hour concentration is 0.4, as seen in Table H.1. Figure H.2 shows that for 15 of 24 hours the wind blows from the west-northwest during June. A 24-hour screening factor could be 0.6 (0.6 ≈ 15hrs/24hrs) based on wind direction alone. This is consistent with the upper bound of the adjustment factors shown in Table H.1. Including the variability for wind speed, ambient temperature, and atmospheric stability could further reduce the estimated scaling factor of 0.6 closer towards the U.S. EPA recommended value of 0.4.

F. Intermittent Release

Support for the U.S. EPA screening factor is demonstrated for a continuous release (i.e., 24 hours per day) in the description above. It is important to be cautious when applying the U.S. EPA screening factors to an intermittent source for the purposes of estimating an annual average concentration (e.g., a business that may only emit during normal operating hours of 8 am to 6 pm).

Intermittent emissions, such as those from burning barrels, testing a standby diesel generator, or any normal business hour operation (e.g., 8am to 6pm Monday through Friday), could have the effect of eliminating some of the annual variability of meteorological conditions. For example, emissions only during the daytime could eliminate the variability of a drainage flow pattern in mountainous terrain. Guidance for estimating long-term averages for a screening approach and intermittent emissions is not available.

For a source located in the LAX meteorological domain, an emission pattern confined to the hours of 1400 to 1600 would eliminate any variability associated with the wind direction. In this case, estimating a 24-hour average with the U.S. EPA scaling factor of 0.4 would be incorrect.

In the event the emissions are intermittent but randomly distributed throughout the day, the scaling factor of 0.4 may be appropriate because the natural diurnal variability of meteorological conditions are concurrent with emissions. An additional pro-rating of the concentration, when estimating a 24-hour concentration, would be required to discount due to the intermittent nature of the emissions.

We recommend the following steps to estimate a screening based estimate of annual average concentrations from intermittent emissions.

1. Estimate the maximum one-hour concentration ($c_{1\text{-hr}}$) based on the SCREEN3 model approach (or similar, e.g., ISCST3 with screening meteorological data) for possible meteorological conditions consistent with the operating conditions and the actual hourly emission rate. It is acceptable to estimate downwind concentrations using all meteorological combinations available to SCREEN3. However, it is possible to be selective for the choices of meteorological conditions and still be conservative. For example, daytime only emissions need not be evaluated for nighttime stable atmospheric conditions (Pasquill-Gifford classes A through D are unstable and neutral atmospheric conditions applicable during the day. Classes D through F are neutral and stable atmospheric conditions applicable during the night.)

2. Estimate the concentration for the longest averaging period applicable based on the length of time of the systematic or randomly distributed emissions and the factors in Table H.1. For example, the longest averaging period concentration that may be estimated with the U.S. EPA scaling factors is an 8-hour concentration ($c_{8\text{-hr}}$) for emissions that are systematically released for 12 hours. Scaling factors between 8-hours and 12-hours are not available. In the case of the 8-hour concentration, the U.S. EPA screening factor of 0.7 ± 0.2 to estimate the maximum 8-hour concentration is appropriate.

   The U.S. EPA Screening Guidance allows for deviation from the suggested conversion factor on a case-by-case basis. We recommend the lower end of the range for the conversion factor (i.e., 0.5 for the 8-hour average) when estimating an annual average concentration. This is because variability associated with seasonal differences in wind speed, wind direction, and atmospheric stability would not be addressed otherwise. As seen in Figure H.2, there are seasonal differences in the wind direction.

For example, if X is the length of time of systematic or randomly distributed emissions, the following scalars can apply.

- $X \leq 2$ hrs; Scalar = 1.0 to estimate a 1-hour average
- 3 hrs $\leq X \leq$ 7 hrs; Scalar = 0.8 to estimate a 3-hour average
- 8 hrs $\leq X \leq$ 20 hrs; Scalar = 0.5 to estimate an 8-hour average (the selection of 20 hours is arbitrary)
- 21 hrs $\leq X \leq$ 24 hrs; this may be a continuous release, use standard screening procedures.

3. Estimate the annual average concentration (c_{annual}) by assuming the longer averaging period estimated above is persistent for the entire year. In the above example the 8-hour concentration is assumed to be persistent for an entire year to estimate an annual average concentration (i.e., the annual average concentration is assumed to be equal to the 8-hour concentration).

   In addition, the annual average concentration should be pro-rated over the final averaging period based on the pro-rated emissions (i.e., the calculation should include the fact that for some hours over the year, the emission rate is zero).

   For example, if Y is the number of operating hours in the year (e.g., Y = X * 365), the following may apply.
   $(c_{annual}) = (c_{1\text{-}hr})$ (Scalar) (Y/8760hrs/yr)

4. The hourly emission rate should be calculated based on the assumed operating schedule in the steps above. An example for a facility operating Y hours per year follows.
   $(q_{hourly}) = (Q_{yearly})/(Y$ hrs/yr)

5. The annual average concentration (or ground level concentration GLC) can be estimated as follows.
   $GLC = (c_{annual})\ (q_{hourly})$
   $= (c_{1\text{-}hr})$(Scalar) (Yhrs/8760hrs) $(Q_{yearly})/(Y$ hrs/yr)
   $= (c_{1\text{-}hr})$(Scalar) $(Q_{yearly})/(8760$ hrs/yr)

Practically speaking, the above five steps condense down to determining three values. The first value is the maximum 1-hour concentration. The second value is the Scalar (either 1.0, 0.8, or 0.5). And the third value is the hourly emission rate estimated by uniformly distributed over the entire year (8760 hours). The operating hours per year drops out of the calculations for an annual average concentration provided the emissions are based on an annual inventory (See step 5).

In the event that the acute averaging period is required and the emissions are based on an annual inventory, then the annual operating hours are required.

Below are four examples using the steps as outlined above. In each case, the annual average concentration is the desired value for use in risk assessment calculations. A fifth example is also

included to demonstrate the need for the operating hours per year for an acute analysis when the inventory is provided on an annual basis.

Example 1 - Fugitive Gasoline Station Emissions

Emissions are **continuous** for 24 hours per day and 365 days per year.

1. Estimate the maximum 1-hour concentration with the Screen3 model (or similar screening modeling approach), $c_{1\text{-hr}}$.

2. Estimate the annual average concentration, $c_{annual,}$ with the U.S. EPA screening factor of 0.08.
   $(c_{annual}) = (c_{1\text{-hr}})(0.08)$

3. The hourly emission rate, q_{hourly}, for the annual average concentration is based on 24 hours per day and 365 days per year (8760 hours per year).
   $(q_{hourly}) = (Q_{yearly})/(8760 \text{ hrs/yr})$

4. The annual average concentration (or ground level concentration GLC) can be estimated as follows.
   $GLC = (c_{annual})\ (q_{hourly})$
   $GLC = (c_{1\text{-hr}})(0.08)\ (Q_{yearly})/(8760 \text{ hrs/yr})$

Example 2 - Dry Cleaner Emissions

Emissions are **intermittent** over the year but **systematic** for 10 hours per day, 5 days per week and 50 weeks per year.

1. Estimate the maximum 1-hour concentration with the Screen3 model (or similar screening modeling approach), $c_{1\text{-hr}}$.

2. Estimate the maximum 8-hour average concentration, $c_{8\text{-hr,}}$ with the U.S. EPA screening factor of 0.7 ± 0.2 as the longest averaging period of continuous release. The averaging period would need to be less than 10 hours. Use the lower range of the screening factor, 0.5, because the annual average is the final product and variability due to seasonal differences are not accounted for otherwise.
   $(c_{8\text{-hr}}) = (c_{1\text{-hr}})(0.5)$

3. Assume the worst-case 8-hour concentration is persistent throughout the year and pro-rate the concentration based on emissions over the year. For this dry cleaner, there are 2500 hours of operating condition emissions. Therefore the annual average is calculated as follows.
   $(c_{annual}) = (c_{8\text{-hr}})\ (2500\text{hrs}/8760\text{hrs})$
   $= (c_{1\text{-hr}})(0.5)\ (2500\text{hrs}/8760\text{hrs})$

4. The hourly emission rate, q_{hourly}, for the annual average concentration is based on 2500 hours per year.
   $(q_{hourly}) = (Q_{yearly})/(2500 \text{ hrs/yr})$

5. The annual average concentration (or ground level concentration GLC) can be estimated as follows.
   $GLC = (c_{annual})(q_{hourly})$
   $= (c_{1\text{-}hr})(0.5)\ (2500hrs/8760hrs)\ (Q_{yearly})/(2500\ hrs/yr)$
   $= (c_{1\text{-}hr})(0.5)\ (Q_{yearly})/(8760\ hrs/yr)$

Example 3 - Burning Barrel Emissions

Emissions are **intermittent** over the year and **random** during daylight hours for two hours per burn, two burns per week, and 52 weeks per year.

1. Estimate the maximum 1-hour concentration with the Screen3 model (or similar screening modeling approach), $c_{1\text{-}hr}$. Meteorological combinations may be restricted to daytime conditions for this screening analysis. Pasquill-Gifford stability classes A, B, C, and D are unstable and neutral conditions for daytime conditions.

2. Estimate the maximum 8-hour average concentration, $c_{8\text{-}hr,}$ with the U.S. EPA screening factor of 0.7 ± 0.2 as the longest averaging period where the emissions have the potential to be randomly distributed. Depending on the day of the year and latitude of the emissions, the daylight hours can vary. For this example, we assume the daylight hours can be as short as 10 hours per day to as long as 14 hours per day. Since the emissions are randomly distributed throughout the daylight hours, the longest averaging period we can scale with U.S. EPA scaling factors is a 10 hour average. In this case, the averaging period becomes the 8-hour average and the scaling factor becomes 0.7 ± 0.2. Again since this is for an annual average, we use the lower end of the range, 0.5.
   $(c_{8\text{-}hr}) = (c_{1\text{-}hr})(0.5)$

3. Assume the worst-case 8-hour concentration is persistent throughout the year and pro-rate the concentration based on the emissions over the year. For the burning barrels there are 208 hours of operating condition emissions (208 hrs = (2hrs/burn)(2burns/wk)(52wk/yr)). Therefore the annual average concentration is calculated as follows.
   $(c_{annual}) = (c_{8\text{-}hr})\ (208hrs/8760hrs)$
   $= (c_{1\text{-}hr})(0.5)\ (208hrs/8760hrs)$

4. The hourly emission rate, q_{hourly}, for the annual average concentration is based on 208 hours per year.
   $(q_{hourly}) = (Q_{yearly})/(208\ hrs/yr)$

5. The annual average concentration (or ground level concentration GLC) can be estimated as follows.
   $GLC = (c_{annual})(q_{hourly})$
   $= (c_{1\text{-}hr})(0.5)\ (208hrs/8760hrs)\ (Q_{yearly})/(208\ hrs/yr)$
   $= (c_{1\text{-}hr})(0.5)\ (Q_{yearly})/(8760\ hrs/yr)$

Example 4 - Standby Diesel Engine Testing

Emissions are **intermittent** over the year and **systematic** for two hours per week and 50 weeks per year. The engine testing is conducted at 2 pm on Fridays.

1. Estimate the maximum 1-hour concentration with the Screen3 model (or similar screening modeling approach), $c_{1\text{-hr}}$. Meteorological combinations may be restricted to daytime conditions in this screening analysis because the engine test is conducted at 2 pm. Pasquill-Gifford stability classes A, B, C, and D are unstable and neutral conditions for daytime conditions.

2. In this case, the emission schedule is systematically fixed over a two hour period. Therefore, the longest averaging period which is applicable for the U.S. EPA screening factors is one-hour because a two-hour conversion factor is not available. Therefore, we assume the maximum 1-hour concentration is persistent for the entire year. We still prorate the concentration based on the emissions. There are 100 hours of engine testing per year. Therefore the annual average concentration becomes.
   $(c_{annual}) = (c_{1\text{-hr}})$ (100hrs/8760hrs)

3. The hourly emission rate, q_{hourly}, for the annual average concentration is based on 100 hours per year.
   $(q_{hourly}) = (Q_{yearly})/(100$ hrs/yr)

4. The annual average concentration (or ground level concentration GLC) can be estimated as follows.
   $GLC = (c_{annual})\ (q_{hourly})$
   $= (c_{1\text{-hr}})$ (100hrs/8760hrs) $(Q_{yearly})/(100$ hrs/yr)
   $= (c_{1\text{-hr}})\ (Q_{yearly})/(8760$ hrs/yr)

Below is an example using the steps above to estimate an acute concentration longer than a 1-hour averaging period. This case is similar to Example 3 above with the exception of the averaging period.

Example 5 - Burning Barrel Emissions – Acute REL

Emissions are **intermittent** over the year and **random** during daylight hours for two **continuous** hours per burn, two burns per week, and 52 weeks per year. The arsenic acute REL is for a 4-hour averaging period. The steps below are used to estimate the acute concentration, 4-hour REL, for arsenic.

1. Estimate the maximum 1-hour concentration with the Screen3 model (or similar screening modeling approach), $c_{1\text{-hr}}$. Meteorological combinations may be restricted to daytime conditions for this screening analysis. Pasquill-Gifford stability classes A, B, C, and D are unstable and neutral conditions for daytime conditions.

2. The maximum 1-hour concentration is used as is without screening adjustment factors listed in Tables H.1 or H.2. The emissions are **continuous** through a 2-hour event within a 4-hour window. The adjustments in Table H.2 would only be used if the

emissions were continuous for a 4-hour event or **randomly** distributed through a 4-hour event.

3. Assume the worst-case 1-hour concentration is persistent for the 4-hour averaging period and pro-rate the concentration based on the emissions over the 4-hour window. For the burning barrels there are 2 hours of operating condition emissions (2hrs/burn). Therefore the 4-hour average concentration is calculated as follows.
   $(c_{4\text{-hr}}) = (c_{1\text{-hr}})$ (2hrs/4hrs)

4. The hourly emission rate, q_{hourly}, for the annual average concentration is based on 208 hours per year (208 hrs = (2hrs/burn)(2burns/wk)(52wk/yr)).
   $(q_{hourly}) = (Q_{yearly})/(208$ hrs/yr)

5. The 4-hr average concentration (or ground level concentration $GLC_{4\text{-hr}}$) can be estimated as follows.
   $GLC_{4\text{-hr}} = (c_{4\text{-hr}})\ (q_{hourly})$
   $= (c_{1\text{-hr}})$ (2hrs/4hrs) $(Q_{yearly})/(208$ hrs/yr)

   This step of Example 5 differs from the previous Examples because the number of operating hours per year does not drop out of the calculation as seen above.

The above methods were used in a recent modeling evaluation for emissions from a burning barrel (example 3 above) (ARB, 2002). Table H.3, below, shows results from the modeling evaluation. Shown in Table H.3 are the maximum annual average concentration based on the screening approach outlined above as well as a refined approach with site specific meteorological data from four locations, Alturas, Bishop, San Benito, and Escondido. As seen in Table H.3, the screening evaluation as described in the example overestimates the values calculated based on the refined analysis. This is the desired outcome of a screening approach.

Table H.3
Maximum Annual Average Concentration (c/q)
Above Ambient Conditions - Burning Barrel Emissions

Met. City	Alturas	Bishop	San Benito	Escondido	*SCREENING*
D (m)	(μg/m³)/(g/s)	(μg/m³)/(g/s)	(μg/m³)/(g/s)	(μg/m³)/(g/s)	*(μg/m³)/(g/s)*
20	44.	61.	85.	110.	*590.*
50	12.	16.	22.	30.	*230.*
100	4.	5.	7.	9.	*85.*

Notes: (a) Annual χ/q is based on 208 hours of emissions at 1 g/s.
(b) χ/q is the concentration in μg/m³ based on an hourly emission rate of 1 g/s.

G. Implementation

The approach outlined above has been implemented in the HARP program. Appendix J provides example output files from the Hot Spot Analysis and Reporting Program (HARP). The HARP software has been developed by a contractor through consultation with OEHHA, Air Resources Board (ARB), and District representatives. The HARP software is the recommended model for calculating and presenting HRA results for the Hot Spots Program. Information on obtaining the HARP software can be found on the ARB's web site at www.arb.ca.gov. Note, since the HARP software is a tool that uses the methods specified in this document, the software will be available after these guidelines have undergone public and peer review, been endorsed by the state's Scientific Review Panel (SRP) on Toxic Air Contaminants, and adopted by OEHHA.

References

ARB (1994). ARB memorandum dated 4/11/94 from A. Ranzieri to J. Brooks on the subject, "One-hour to Thirty-day Average Screening Factor."

ARB (2002). Staff Report: Initial Statement of Reasons for the Proposed Airborne Toxic Control Measure to Reduce Emissions of Toxic Air Contaminants from Outdoor Residential Waste Burning, January 2002. California Air Resources Board.

U.S. EPA (1992). Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised, October 1992, EPA-454/R-92-019. U.S. Environmental Protection Agency, Research Triangle Park, NC.

U.S. EPA (1995). User's Guide for the Industrial Source Complex (ISC3) Dispersion Models, September 1995, EPA-454/B-95-003a. U.S. Environmental Protection Agency, Research Triangle Park, NC.

U.S. EPA (2001). Appendix W to Part 51 - Guideline on Air Quality Models, 2001. U.S. Environmental Protection Agency, Research Triangle Park, NC.

Appendix I

OEHHA/ARB Approved Health Values

for Use in Hot Spot Facility Risk Assessments

Purpose of the Appendix I Tables:

The purpose of the following reference tables is to provide a quick list of all health values that have been approved by the Office of Environmental Health Hazard Assessment (OEHHA) and the Air Resources Board (ARB) for use in facility health risk assessments conducted for the AB 2588 Air Toxics Hot Spots Program. The OEHHA has developed and adopted new risk assessment guidelines that update and replace the California Air Pollution Control Officers Association's (CAPCOA) *Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines, October 1993*.

The following tables list the OEHHA adopted inhalation and oral cancer slope factors, noncancer acute Reference Exposure Levels (RELs), and inhalation and oral noncancer chronic RELs. In addition, these tables list the substances in Appendix A-I *(Substances For Which Emissions Must Be Quantified*) and Appendix F (*Criteria For Inputs For Risk Assessment Using Screening Air Dispersion Modeling*) of the ARB's *Hot Spots Emission Inventory Criteria and Guidelines (EICG) (July 1997).* OEHHA is still in the process of adopting new noncancer chronic RELs. Therefore, new health values will periodically be added to, or deleted from, these tables. Users of these tables are advised to monitor the OEHHA website (*www.oehha.ca.gov*) for any updates to the health values.

Substances written in *italics* do not have explicit OEHHA approved health values, but are included in this table to clarify applicability of OEHHA adopted heath effects values to individual or grouped substances listed in the *Hot Spots Emission Inventory Criteria and Guidelines*, Appendix A-I list of *"Substances For Which Emissions Must Be Quantified."*

The "Date Value Reviewed" column lists the date that the health value was last reviewed by OEHHA and the Scientific Review Panel, and/or approved for use in the AB 2588 Air Toxics Hot Spots Program. This information is useful to tell where the number came from. If the health value is unchanged since it was first approved for use in the Hot Spots Program, then the date that the value was first approved for use by CAPCOA is listed within the brackets [ ].

- April 1999 is listed for the cancer potency values and noncancer acute RELs, which have been adopted by the OEHHA as part of the AB 2588 "Hot Spots" Risk Assessment Guidelines.
- February 2000, April 2000, January 2001, and December 2001 are listed for the first set of 22, the second set of 16, the third set of 22, and the fourth set of 12 noncancer chronic RELs, respectively.
- The chronic REL for carbon disulfide was adopted in May 2002. Chronic RELs for phosphine and triethylamine were adopted in September 2002. Chronic RELs for fluorides including hydrogen fluoride were adopted August 2003.
- October 2000 is listed for the oral chronic RELs and oral cancer slope factors. 1996 is listed for the U.S. EPA Reference Concentrations. Dates of 1990-1992 and 1996 are listed for CAPCOA chronic RELs that may eventually be dropped or replaced.
- For the substances identified as Toxic Air Contaminants, the Air Resources Board hearing date is listed. The dates for acetaldehyde, benzo[a]pyrene, and methyl tertiary-butyl ether represent the dates the values were approved by the Scientific Review Panel.

December 2003 Changes to the ARB Consolidated Table of Health Values

Below is a list of changes made to the September 2002 Consolidated Table of Health Values, which was the last published version of this table.

New Substances:

- The Office of Environmental Health Hazard Assessment (OEHHA) has adopted the WHO_{97} Toxicity Equivalency Factors for polychlorinated dibenzo-*p*-dioxins and dibenzofurans, and dioxin-like polychlorinated biphenyls (see OEHHA memo August 29, 2003). Values changed for:
  1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin;
  1,2,3,4,6,7,8,9-Octachlorodibenzo-*p*-dioxin; and
  1,2,3,4,6,7,8,9-Octachlorodibenzofuran
- Polychlorinated biphenyls (speciated): Twelve dioxin-like PCBs have been added to the list (see OEHHA memo August 29, 2003). Cancer and chronic inhalation and oral values were added for these substances.
- Phosphine: Inhalation chronic REL adopted in September 2002.

New Health Values:

- Fluorides including Hydrogen Fluoride: Chronic inhalation and oral RELs were adopted for Fluorides including Hydrogen Fluoride (see OEHHA memo August 14, 2003). Note: these are multipathway substances. However, OEHHA is still developing the transfer factors for these substances. Therefore, until the new transfer factors are developed, HARP will NOT calculate fluorides as multipathway. A new health table for HARP will be distributed when the transfer factors are available.
- Triethylamine: Inhalation chronic REL adopted in September 2002.
- Carbon disulfide: Inhalation chronic REL adopted in May 2002.
- Polychlorinated biphenyls: Low risk PCB renamed to lowest risk PCB. Inhalation and oral cancer values added for low risk PCB.

Removed:

- Chromium (hexavalent): The oral cancer slope factor has been withdrawn
- Dimethylamine: The substance is not listed in the Hot Spots Emission Inventory Criteria and Guidelines Report

Changes/Corrections:

★ (Listed in *Appendix I, Additions and Corrections The Air Toxics Hot Spots Program Risk Assessment Guidelines; Part II; Technical Support Document for Describing Available Cancer Potency Factors*)

- 1,6-Dinitropyrene★: CAS number changed from 4239-76-48 to 42397-64-8.
- 1,8-Dinitropyrene★: CAS number changed from 4239-76-59 to 42397-65-9.
- Ethylene dichloride★: Cancer slope factor changed from 7.0 E-2 $(mg/kg\text{-}day)^{-1}$ to 7.2 E-2 $(mg/kg\text{-}day)^{-1}$, Cancer unit risk changed from 2.2 E-5 $(\mu g/m^3)^{-1}$ to 2.1 E-5 $(\mu g/m^3)^{-1}$.

- N-Nitrosodi-n-butylamine*: name changed from N-Nitroso-n-dibutylamine.
- Methyl tertiary-butyl ether: inhalation cancer potency factor changed from 9.4E-04 (mg/kg-day)$^{-1}$ to 1.8E-3 (mg/kg-day)$^{-1}$.

Table 1
CONSOLIDATED TABLE OF OEHHA/ARB APPROVED RISK ASSESSMENT HEALTH VALUES

Chemical	Chemical Abstract Number	Noncancer Effects						Cancer Risk					
		Acute Inhalation ($\mu g/m^3$)	Date Value Reviewed [Added]	Chronic Inhalation ($\mu g/m^3$)	Date Value Reviewed [Added]	Chronic Oral (mg/kg/d)	Date Value Reviewed [Added]	Inhalation Unit Risk $(\mu g/m^3)^{-1}$	Inhalation Cancer Potency Factor $(mg/kg\text{-}d)^{-1}$	Date Value Reviewed [Added]	Oral Slope Factor $(mg/kg\text{-}d)^{-1}$	Date Value Reviewed [Added]	MWAF
ACETALDEHYDE	75-07-0			9.0E+00	5/93			2.7E-06	1.0E-02	4/99 [5/93]			1
ACETAMIDE	60-35-5							2.0E-05	7.0E-02	4/99			1
ACROLEIN	107-02-8	1.9E-01	4/99	6.0E-02	1/01								1
ACRYLAMIDE	79-06-1			7.0E-01	1/91			1.3E-03	4.5E+00	4/99 [7/90]			1
ACRYLIC ACID	79-10-7	6.0E+03	4/99	1.0E+00 RfC	1996								1
ACRYLONITRILE	107-13-1			5.0E+00	12/01			2.9E-04	1.0E+00	4/99 [1/91]			1
ALLYL CHLORIDE	107-05-1			1.0E+00 RfC	1996			6.0E-06	2.1E-02	4/99			1
2-AMINOANTHRAQUINONE	117-79-3							9.4E-06	3.3E-02	4/99			1
AMMONIA	7664-41-7	3.2E+03	4/99	2.0E+02	2/00								1
ANILINE	62-53-3			1.0E+00 RfC	1996			1.6E-06	5.7E-03	4/99			1
Antimony Compounds	*7440-36-0*			*2.0E-01 RfC*	*1996*								*1*
ANTIMONY TRIOXIDE	1309-64-4			2.0E-01 RfC	1996								1
ARSENIC AND COMPOUNDS (INORGANIC) TAC	7440-38-2 1016 [1015]	1.9E-01 AveP	4/99	3.0E-02	1/01	3.0E-04	10/00	3.3E-03 TAC	1.2E+01	7/90	1.5E+00	10/00	1
ARSINE	7784-42-1	1.6E+02	4/99	5.0E-02 RfC	1996								0.9612
ASBESTOS TAC ¤	1332-21-4							1.9E-04 TAC ¤	2.2E+02	3/86			333.33
BENZENE TAC	71-43-2	1.3E+03 AveP	4/99	6.0E+01	2/00			2.9E-05 TAC	1.0E-01	1/85			1
BENZIDINE (AND ITS SALTS) *values also apply to:*	92-87-5			1.0E+01	1/91			1.4E-01	5.0E+02	4/99 [1/91]			1
Benzidine based dyes	*1020*			*1.0E+01*	*1/91*			*1.4E-01*	*5.0E+02*	*4/99 [1/91]*			*1*
Direct Black 38	*1937-37-7*			*1.0E+01*	*1/91*			*1.4E-01*	*5.0E+02*	*4/99 [1/91]*			*1*
Direct Blue 6	*2602-46-2*			*1.0E+01*	*1/91*			*1.4E-01*	*5.0E+02*	*4/99 [1/91]*			*1*
Direct Brown 95 (technical grade)	*16071-86-6*			*1.0E+01*	*1/91*			*1.4E-01*	*5.0E+02*	*4/99 [1/91]*			*1*
BENZYL CHLORIDE	100-44-7	2.4E+02	4/99	1.2E+01	1/92			4.9E-05	1.7E-01	4/99			1
BERYLLIUM AND COMPOUNDS	7440-41-7 [1021]			7.0E-03	12/01	2.0E-03	12/01	2.4E-03	8.4E+00	4/99 [7/90]			1
BIS(2-CHLOROETHYL)ETHER (Dichloroethyl ether)	111-44-4							7.1E-04	2.5E+00	4/99			1
BIS(CHLOROMETHYL)ETHER	542-88-1							1.3E-02	4.6E+01	4/99 [1/91]			1

Table last updated: December 4, 2003

Table 1
CONSOLIDATED TABLE OF OEHHA/ARB APPROVED RISK ASSESSMENT HEALTH VALUES

Chemical	Chemical Abstract Number	Noncancer Effects						Cancer Risk					
		Acute Inhalation ($\mu g/m^3$)	Date Value Reviewed [Added]	Chronic Inhalation ($\mu g/m^3$)	Date Value Reviewed [Added]	Chronic Oral (mg/kg/d)	Date Value Reviewed [Added]	Inhalation Unit Risk $(\mu g/m^3)^{-1}$	Inhalation Cancer Potency Factor $(mg/kg\text{-}d)^{-1}$	Date Value Reviewed [Added]	Oral Slope Factor $(mg/kg\text{-}d)^{-1}$	Date Value Reviewed [Added]	MWAF
BROMINE AND COMPOUNDS	7726-95-6 [1040]			1.7E+00	1/92								1
BROMINE PENTAFLUORIDE	7789-30-2			1.7E+00	1/92								1
HYDROGEN BROMIDE	10035-10-6			2.4E+01	1/92								1
POTASSIUM BROMATE	7758-01-2			*1.7E+00*	*1/92*			1.4E-04	4.9E-01	4/99 [10/93]			1
1,3-BUTADIENE TAC	106-99-0			2.0E+01	1/01			1.7E-04 TAC	6.0E-01	7/92			1
CADMIUM AND COMPOUNDS TAC	7440-43-9 [1045]			2.0E-02	1/01	5.0E-04	10/00	4.2E-03 TAC	1.5E+01	1/87			1
CARBON DISULFIDE	75-15-0	6.2E+03 AveP	4/99	8.0E+02	5/02								1
CARBON MONOXIDE	630-08-0	2.3E+04	4/99										1
CARBON TETRACHLORIDE TAC (Tetrachloromethane)	56-23-5	1.9E+03 AveP	4/99	4.0E+01	1/01			4.2E-05 TAC	1.5E-01	9/87			1
CHLORINATED PARAFFINS	108171-26-2							2.5E-05	8.9E-02	4/99			1
CHLORINE	7782-50-5	2.1E+02	4/99	2.0E-01	2/00								1
CHLORINE DIOXIDE	10049-04-4			6.0E-01	1/01								1
4-CHLORO-O-PHENYLENEDIAMINE	95-83-0							4.6E-06	1.6E-02	4/99			1
2-CHLOROACETOPHENONE	532-27-4			3.0E-02 RfC	1996								1
CHLOROBENZENE	108-90-7			1.0E+03	1/01								1
CHLORODIFLUOROMETHANE ... (see Fluorocarbons)													
CHLOROFORM TAC	67-66-3	1.5E+02 AveP	4/99	3.0E+02	4/00			5.3E-06 TAC	1.9E-02	12/90			1
Chlorophenols	*1060*												*1*
2-CHLOROPHENOL	95-57-8			1.8E+01	1/91								1
PENTACHLOROPHENOL	87-86-5			2.0E-01	1/92			5.1E-06	1.8E-02	4/99			1
TETRACHLOROPHENOLS	25167-83-3			8.8E+01	1/92								1
2,3,4,6-Tetrachlorophenol	*58-90-2*			*8.8E+01*	*1/92*								*1*
2,4,6-TRICHLOROPHENOL	88-06-2							2.0E-05	7.0E-02	4/99 [1/91]			1
CHLOROPICRIN	76-06-2	2.9E+01	4/99	4.0E-01	12/01								1
CHLOROPRENE	126-99-8			1.0E+00	1/92								1
p-CHLORO-o-TOLUIDINE	95-69-2							7.7E-05	2.7E-01	4/99			1
CHROMIUM 6+ TAC *values also apply to:*	18540-29-9			2.0E-01	1/01	2.0E-02	10/00	1.5E-01 TAC	5.1E+02	1/86	Æ		1
Barium chromate	*10294-40-3*			*2.0E-01*	*1/01*	*2.0E-02*	*10/00*	*1.5E-01 TAC*	*5.1E+02*	*1/86*	Æ		*0.2053*
Calcium chromate	*13765-19-0*			*2.0E-01*	*1/01*	*2.0E-02*	*10/00*	*1.5E-01 TAC*	*5.1E+02*	*1/86*	Æ		*0.3332*

Table last updated: December 4, 2003

Table 1
CONSOLIDATED TABLE OF OEHHA/ARB APPROVED RISK ASSESSMENT HEALTH VALUES

Chemical	Chemical Abstract Number	Noncancer Effects						Cancer Risk					
		Acute Inhalation ($\mu g/m^3$)	Date Value Reviewed [Added]	Chronic Inhalation ($\mu g/m^3$)	Date Value Reviewed [Added]	Chronic Oral (mg/kg/d)	Date Value Reviewed [Added]	Inhalation Unit Risk $(\mu g/m^3)^{-1}$	Inhalation Cancer Potency Factor $(mg/kg\text{-}d)^{-1}$	Date Value Reviewed [Added]	Oral Slope Factor $(mg/kg\text{-}d)^{-1}$	Date Value Reviewed [Added]	MWAF
Lead chromate	*7758-97-6*			*2.0E-01*	*1/01*	*2.0E-02*	*10/00*	*1.5E-01* TAC	*5.1E+02*	*1/86*	Æ		*0.1609*
Sodium dichromate	*10588-01-9*			*2.0E-01*	*1/01*	*2.0E-02*	*10/00*	*1.5E-01* TAC	*5.1E+02*	*1/86*	Æ		*0.397*
Strontium chromate	*7789-06-2*			*2.0E-01*	*1/01*	*2.0E-02*	*10/00*	*1.5E-01* TAC	*5.1E+02*	*1/86*	Æ		*0.2554*
CHROMIUM TRIOXIDE (as chromic acid mist)	1333-82-0			2.0E-03	1/01	2.0E-02	10/00	1.5E-01 TAC	5.1E+02	1/86	Æ		0.52
COPPER AND COMPOUNDS	7440-50-8 [1067]	1.0E+02	4/99	2.4E+00	1/92								1
p-CRESIDINE	120-71-8							4.3E-05	1.5E-01	4/99			1
CRESOLS (mixtures of)	1319-77-3			6.0E+02	1/01								1
m-CRESOL	108-39-4			6.0E+02	1/01								1
o-CRESOL	95-48-7			6.0E+02	1/01								1
p-CRESOL	106-44-5			6.0E+02	1/01								1
CUPFERRON	135-20-6							6.3E-05	2.2E-01	4/99			1
Cyanide Compounds (inorganic)	*57-12-5 1073*	*3.4E+02*	*4/99*	*9.0E+00*	*4/00*								*1*
HYDROGEN CYANIDE (Hydrocyanic acid)	74-90-8	3.4E+02	4/99	9.0E+00	4/00								1
2,4-DIAMINOANISOLE	615-05-4							6.6E-06	2.3E-02	4/99			1
2,4-DIAMINOTOLUENE	95-80-7							1.1E-03	4.0E+00	4/99			1
1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	96-12-8			2.0E-01	1/92			2.0E-03	7.0E+00	4/99 [1/92]			1
p-DICHLOROBENZENE	106-46-7			8.0E+02	1/01			1.1E-05	4.0E-02	4/99 [1/91]			1
3,3-DICHLOROBENZIDINE	91-94-1							3.4E-04	1.2E+00	4/99 [1/91]			1
1,1,-DICHLOROETHANE (Ethylidene dichloride)	75-34-3							1.6E-06	5.7E-03	4/99			1
1,1-DICHLOROETHYLENE … (see Vinylidene Chloride)													
DI(2-ETHYLHEXYL)PHTHALATE (DEHP)	117-81-7			7.0E+01	1/91			2.4E-06	8.4E-03	4/99 [1/92]	8.4E-03	10/00	1
DIESEL EXHAUST … (see Particulate Emissions from Diesel-Fueled Engines)													
DIETHANOLAMINE	111-42-2			3.0E+00	12/01								
p-DIMETHYLAMINOAZOBENZENE	60-11-7							1.3E-03	4.6E+00	4/99			1
N,N-DIMETHYL FORMAMIDE	68-12-2			8.0E+01	1/01								1
2,4-DINITROTOLUENE	121-14-2							8.9E-05	3.1E-01	4/99			1

Table last updated: December 4, 2003

Table 1
CONSOLIDATED TABLE OF OEHHA/ARB APPROVED RISK ASSESSMENT HEALTH VALUES

Chemical	Chemical Abstract Number	Noncancer Effects						Cancer Risk					
		Acute Inhalation ($\mu g/m^3$)	Date Value Reviewed [Added]	Chronic Inhalation ($\mu g/m^3$)	Date Value Reviewed [Added]	Chronic Oral (mg/kg/d)	Date Value Reviewed [Added]	Inhalation Unit Risk $(\mu g/m^3)^{-1}$	Inhalation Cancer Potency Factor $(mg/kg\text{-}d)^{-1}$	Date Value Reviewed [Added]	Oral Slope Factor $(mg/kg\text{-}d)^{-1}$	Date Value Reviewed [Added]	MWAF
1,4-DIOXANE (1,4-Diethylene dioxide)	123-91-1	3.0E+03	4/99	3.0E+03	4/00			7.7E-06	2.7E-02	4/99 [1/91]			1
EPICHLOROHYDRIN (1-Chloro-2,3-epoxypropane)	106-89-8	1.3E+03	4/99	3.0E+00	1/01			2.3E-05	8.0E-02	4/99 [1/92]			1
1,2-EPOXYBUTANE	106-88-7			2.0E+01	1/01								1
ETHYL ACRYLATE	140-88-5			4.8E+01	1/92								1
ETHYL BENZENE	100-41-4			2.0E+03	2/00								1
ETHYL CHLORIDE (Chloroethane)	75-00-3			3.0E+04	4/00								1
ETHYLENE DIBROMIDE TAC (1,2-Dibromoethane)	106-93-4			8.0E-01	12/01			7.1E-05 TAC	2.5E-01	7/85			1
ETHYLENE DICHLORIDE TAC (1,2-Dichloroethane)	107-06-2			4.0E+02	1/01			2.1E-05 TAC	7.2E-02	9/85			1
ETHYLENE GLYCOL	107-21-1			4.0E+02	4/00								1
ETHYLENE GLYCOL BUTYL ETHER … (see Glycol ethers)													
ETHYLENE OXIDE TAC (1,2-Epoxyethane)	75-21-8			3.0E+01	1/01			8.8E-05 TAC	3.1E-01	11/87			1
ETHYLENE THIOUREA	96-45-7							1.3E-05	4.5E-02	4/99			1
Fluorides	1101	*2.4E+02*	*4/99*	1.3E+01	8/03	4.0E-02	8/03						*1*
HYDROGEN FLUORIDE (Hydrofluoric acid)	7664-39-3	2.4E+02	4/99	1.4E+01	8/03	4.0E-02	8/03						1
FLUOROCARBONS (chlorinated) *values also apply to:*	1104 [1105]			7.0E+02	1/91								1
Chlorinated fluorocarbon (CFC-113)	*76-13-1*			*7.0E+02*	*1/91*								*1*
CHLORODIFLUOROMETHANE (Freon 22)	75-45-6			5.0E+04 RfC	1996								1
Dichlorofluoromethane (Freon 12)	*75-43-4*			*7.0E+02*	*1/91*								*1*
Trichlorofluoromethane (Freon 11)	*75-69-4*			*7.0E+02*	*1/91*								*1*
Fluorocarbons (brominated)	*1103*			*7.0E+02*	*1/91*								*1*
FORMALDEHYDE TAC	50-00-0	9.4E+01	4/99	3.0E+00	2/00			6.0E-06 TAC	2.1E-02	3/92			1
GASOLINE VAPORS	1110			2.1E+03	1/91								1
GLUTARALDEHYDE	111-30-8			8.0E-02	1/01								1
GLYCOL ETHERS	1115												1
ETHYLENE GLYCOL BUTYL ETHER – EGBE	111-76-2	1.4E+04	4/99	2.0E+01	1/92								1
ETHYLENE GLYCOL ETHYL ETHER – EGEE	110-80-5	3.7E+02 AveP	4/99[1/92]	7.0E+01	2/00								1
ETHYLENE GLYCOL ETHYL ETHER ACETATE – EGEEA	111-15-9	1.4E+02 AveP	4/99	3.0E+02	2/00								1

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Chemical	Chemical Abstract Number	Noncancer Effects						Cancer Risk					
		Acute Inhalation ($\mu g/m^3$)	Date Value Reviewed [Added]	Chronic Inhalation ($\mu g/m^3$)	Date Value Reviewed [Added]	Chronic Oral (mg/kg/d)	Date Value Reviewed [Added]	Inhalation Unit Risk $(\mu g/m^3)^{-1}$	Inhalation Cancer Potency Factor $(mg/kg\text{-}d)^{-1}$	Date Value Reviewed [Added]	Oral Slope Factor $(mg/kg\text{-}d)^{-1}$	Date Value Reviewed [Added]	MAF
ETHYLENE GLYCOL METHYL ETHER – EGME	109-86-4	9.3E+01 AveP	4/99	6.0E+01	2/00								1
ETHYLENE GLYCOL METHYL ETHER ACETATE – EGMEA	110-49-6			9.0E+01	2/00								1
HEXACHLOROBENZENE	118-74-1			2.8E+00	7/90			5.1E-04	1.8E+00	4/99 [1/91]			1
HEXACHLOROCYCLOHEXANES (mixed or technical grade)	608-73-1 1120			1.0E+00	1/91	3.0E-04	1/91	1.1E-03	4.0E+00	4/99 [1/91]	4.0E+00	10/00 [1/92]	1
alpha-HEXACHLOROCYCLOHEXANE	319-84-6			1.0E+00	1/91	3.0E-04	1/91	1.1E-03	4.0E+00	4/99 [1/91]	4.0E+00	10/00 [1/92]	1
beta- HEXACHLOROCYCLOHEXANE	319-85-7			1.0E+00	1/91	3.0E-04	1/91	1.1E-03	4.0E+00	4/99 [1/91]	4.0E+00	10/00 [1/92]	1
gamma-HEXACHLOROCYCLOHEXANE (Lindane)	58-89-9			1.0E+00	1/91	3.0E-04	1/91	3.1E-04	1.1E+00	4/99	1.1E+00	10/00	1
HEXACHLOROCYCLOPENTADIENE	77-47-4			2.4E-01	1/91								1
n-HEXANE	110-54-3			7.0E+03	4/00								1
HYDRAZINE	302-01-2			2.0E-01	1/01			4.9E-03	1.7E+01	4/99 [7/90]			1
HYDROCHLORIC ACID (Hydrogen chloride)	7647-01-0	2.1E+03	4/99	9.0E+00	2/00								1
HYDROGEN BROMIDE … (see Bromine & Compounds)													
HYDROGEN CYANIDE … (see Cyanide & Compounds)													
HYDROGEN FLUORIDE … (see Fluorides & Compounds)													
HYDROGEN SELENIDE … (see Selenium & Compounds)													
HYDROGEN SULFIDE	7783-06-4	4.2E+01	4/99[7/90]	1.0E+01	4/00								1
ISOPHORONE	78-59-1			2.0E+03	12/01								
ISOPROPYL ALCOHOL (Isopropanol)	67-63-0	3.2E+03	4/99	7.0E+03	2/00								1
LEAD AND COMPOUNDS[TAC] (inorganic) *values also apply to:*	7439-92-1 1128 [1130]							1.2E-05 TAC	4.2E-02	4/97	8.5E-03	10/00	1
Lead acetate	*301-04-2*							*1.2E-05 TAC*	*4.2E-02*	*4/97*	*8.5E-03*	*10/00*	*0.637*
Lead phosphate	*7446-27-7*							*1.2E-05 TAC*	*4.2E-02*	*4/97*	*8.5E-03*	*10/00*	*0.7659*
Lead subacetate	*1335-32-6*							*1.2E-05 TAC*	*4.2E-02*	*4/97*	*8.5E-03*	*10/00*	*0.7696*
LINDANE ... (see gamma-Hexachlorocyclohexane)													
MALEIC ANHYDRIDE	108-31-6			7.0E-01	12/01								1

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Table 1
CONSOLIDATED TABLE OF OEHHA/ARB APPROVED RISK ASSESSMENT HEALTH VALUES

Chemical	Chemical Abstract Number	Noncancer Effects						Cancer Risk					
		Acute Inhalation ($\mu g/m^3$)	Date Value Reviewed [Added]	Chronic Inhalation ($\mu g/m^3$)	Date Value Reviewed [Added]	Chronic Oral (mg/kg/d)	Date Value Reviewed [Added]	Inhalation Unit Risk $(\mu g/m^3)^{-1}$	Inhalation Cancer Potency Factor $(mg/kg\text{-}d)^{-1}$	Date Value Reviewed [Added]	Oral Slope Factor $(mg/kg\text{-}d)^{-1}$	Date Value Reviewed [Added]	MWAF
MANGANESE AND COMPOUNDS	7439-96-5 [1132]			2.0E-01	4/00								1
MERCURY AND COMPOUNDS (INORGANIC)	7439-97-6 [1133]	1.8E+00	4/99	9.0E-02	2/00	3.0E-04	10/00 [1/92]						1
Mercuric chloride	*7487-94-7*	*1.8E+00*	*4/99*	*9.0E-02*	*2/00*	*3.0E-04*	*10/00 [1/92]*						*1*
MERCURY AND COMPOUNDS (ORGANIC) *values also apply to:*	N/A												1
METHYL MERCURY	593-74-8			1.0E+00	1/91								1
METHANOL	67-56-1	2.8E+04	4/99	4.0E+03	4/00								1
METHYL BROMIDE (Bromomethane)	74-83-9	3.9E+03	4/99	5.0E+00	2/00								1
METHYL tertiary-BUTYL ETHER	1634-04-4			8.0E+03	2/00			2.6E-07	1.8E-03	11/99			1
METHYL CHLOROFORM (1,1,1-Trichloroethane)	71-55-6	6.8E+04	4/99	1.0E+03	2/00								1
METHYL ETHYL KETONE (2-Butanone)	78-93-3	1.3E+04	4/99	1.0E+03 RfC	1996								1
METHYL ISOCYANATE	624-83-9			1.0E+00	12/01								1
METHYL MERCURY ... (see Mercury & Compounds)													
METHYL METHACRYLATE	80-62-6			9.8E+02	1/92								1
4,4'-METHYLENE BIS (2-CHLOROANILINE) (MOCA)	101-14-4							4.3E-04	1.5E+00	4/99			1
METHYLENE CHLORIDE TAC (Dichloromethane)	75-09-2	1.4E+04	4/99	4.0E+02	2/00			1.0E-06 TAC	3.5E-03	7/89			1
4,4'-METHYLENE DIANILINE (AND ITS DICHLORIDE)	101-77-9			2.0E+01	12/01			4.6E-04	1.6E+00	4/99	1.6E+00	10/00	1
METHYLENE DIPHENYL ISOCYANATE	101-68-8			7.0E-01	1/01								1
MICHLER'S KETONE (4,4'-Bis(dimethylamino)benzophenone)	90-94-8							2.5E-04	8.6E-01	4/99			1
MINERAL FIBERS (<1% FREE SILICA)	N/A			2.4E+01	1/92								1
Ceramic fibers (man-made)	*1056*			*2.4E+01*	*1/92*								*1*
Glasswool (man-made fibers)	*1111*			*2.4E+01*	*1/92*								*1*
Mineral fibers (fine: man-made)	*1136*			*2.4E+01*	*1/92*								*1*
Rockwool (man-made fibers)	*1168*			*2.4E+01*	*1/92*								*1*
Slagwool (man-made fibers)	*1181*			*2.4E+01*	*1/92*								*1*
N-NITROSODI-n-BUTYLAMINE	924-16-3							3.1E-03	1.1E+01	4/99 [1/92]			1
N-NITROSODI-n-PROPYLAMINE	621-64-7							2.0E-03	7.0E+00	4/99 [1/91]			1
N-NITROSODIETHYLAMINE	55-18-5							1.0E-02	3.6E+01	4/99 [1/91]			1

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Table 1
CONSOLIDATED TABLE OF OEHHA/ARB APPROVED RISK ASSESSMENT HEALTH VALUES

Chemical	Chemical Abstract Number	Noncancer Effects						Cancer Risk					
		Acute Inhalation ($\mu g/m^3$)	Date Value Reviewed [Added]	Chronic Inhalation ($\mu g/m^3$)	Date Value Reviewed [Added]	Chronic Oral (mg/kg/d)	Date Value Reviewed [Added]	Inhalation Unit Risk $(\mu g/m^3)^{-1}$	Inhalation Cancer Potency Factor $(mg/kg\text{-}d)^{-1}$	Date Value Reviewed [Added]	Oral Slope Factor $(mg/kg\text{-}d)^{-1}$	Date Value Reviewed [Added]	MWAF
N-NITROSODIMETHYLAMINE	62-75-9							4.6E-03	1.6E+01	4/99 [1/91]			1
N-NITROSODIPHENYLAMINE	86-30-6							2.6E-06	9.0E-03	4/99			1
N-NITROSO-N-METHYLETHYLAMINE	10595-95-6							6.3E-03	2.2E+01	4/99 [7/90]			1
N-NITROSOMORPHOLINE	59-89-2							1.9E-03	6.7E+00	4/99 [7/92]			1
N-NITROSOPIPERIDINE	100-75-4							2.7E-03	9.4E+00	4/99 [7/92]			1
N-NITROSOPYRROLIDINE	930-55-2							6.0E-04	2.1E+00	4/99 [7/90]			1
NAPHTHALENE ... (see Polycyclic aromatic hydrocarbons)													
NICKEL AND COMPOUNDS[TAC] *values also apply to:*	7440-02-0 [1145]	6.0E+00	4/99	5.0E-02	2/00	5.0E-02	10/00	2.6E-04 TAC	9.1E-01	8/91			1
Nickel acetate	*373-02-4*	*6.0E+00*	*4/99*	*5.0E-02*	*2/00*	*5.0E-02*	*10/00*	*2.6E-04 TAC*	*9.1E-01*	*8/91*			*0.3321*
Nickel carbonate	*3333-39-3*	*6.0E+00*	*4/99*	*5.0E-02*	*2/00*	*5.0E-02*	*10/00*	*2.6E-04 TAC*	*9.1E-01*	*8/91*			*0.4945*
Nickel carbonyl	*13463-39-3*	*6.0E+00*	*4/99*	*5.0E-02*	*2/00*	*5.0E-02*	*10/00*	*2.6E-04 TAC*	*9.1E-01*	*8/91*			*0.3438*
Nickel hydroxide	*12054-48-7*	*6.0E+00*	*4/99*	*5.0E-02*	*2/00*	*5.0E-02*	*10/00*	*2.6E-04 TAC*	*9.1E-01*	*8/91*			*0.6332*
Nickelocene	*1271-28-9*	*6.0E+00*	*4/99*	*5.0E-02*	*2/00*	*5.0E-02*	*10/00*	*2.6E-04 TAC*	*9.1E-01*	*8/91*			*0.4937*
NICKEL OXIDE	1313-99-1	6.0E+00	4/99	1.0E-01	2/00	5.0E-02	10/00	2.6E-04 TAC	9.1E-01	8/91			0.7859
Nickel refinery dust from the pyrometallurgical process	*1146*	*6.0E+00*	*4/99*	*5.0E-02*	*2/00*	*5.0E-02*	*10/00*	*2.6E-04 TAC*	*9.1E-01*	*8/91*			*1*
Nickel subsulfide	*12035-72-2*	*6.0E+00*	*4/99*	*5.0E-02*	*2/00*	*5.0E-02*	*10/00*	*2.6E-04 TAC*	*9.1E-01*	*8/91*			*0.2443*
NITRIC ACID	7697-37-2	8.6E+01	4/99										1
NITROBENZENE	98-95-3			1.7E+00	1/91								1
NITROGEN DIOXIDE	10102-44-0	4.7E+02	4/99[1/92]	4.7E+02	1/92								1
2-NITROPROPANE	79-46-9			2.0E+01	1/92								1
p-NITROSODIPHENYLAMINE	156-10-5							6.3E-06	2.2E-02	4/99			1
OZONE	10028-15-6	1.8E+02	4/99[1/92]	1.8E+02	1/92								1
PARTICULATE EMISSIONS FROM DIESEL-FUELED ENGINES[TAC] ■	9901			5.0E+00 TAC	8/98			3.0E-04 TAC	1.1E+00	8/98			1
PENTACHLOROPHENOL ... (see Chlorophenols)													
PERCHLOROETHYLENE[TAC] (Tetrachloroethylene)	127-18-4	2.0E+04	4/99	3.5E+01 TAC	10/91			5.9E-06 TAC	2.1E-02	10/91			1
PHENOL	108-95-2	5.8E+03	4/99	2.0E+02	4/00								1

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Table 1
CONSOLIDATED TABLE OF OEHHA/ARB APPROVED RISK ASSESSMENT HEALTH VALUES[●]

Chemical	Chemical[▼] Abstract Number	Noncancer Effects						Cancer Risk					
		Acute Inhalation ($\mu g/m^3$)	Date[◆] Value Reviewed [Added]	Chronic Inhalation ($\mu g/m^3$)	Date[◆] Value Reviewed [Added]	Chronic Oral (mg/kg/d)	Date[◆] Value Reviewed [Added]	Inhalation[▪] Unit Risk $(\mu g/m^3)^{-1}$	Inhalation[▪] Cancer Potency Factor $(mg/kg\text{-}d)^{-1}$	Date[◆] Value Reviewed [Added]	Oral Slope Factor $(mg/kg\text{-}d)^{-1}$	Date[◆] Value Reviewed [Added]	M[♣] W A F
PHOSGENE	75-44-5	4.0E+00	4/99										1
PHOSPHINE	7803-51-2			8.0E-01	9/02								1
PHOSPHORIC ACID	7664-38-2			7.0E+00	2/00								1
PHOSPHORUS (WHITE)	7723-14-0			7.0E-02	1/91								1
PHTHALIC ANHYDRIDE	85-44-9			2.0E+01	1/01								1
PCB (POLYCHLORINATED BIPHENYLS) (unspeciated mixture) [lowest risk]★	1336-36-3			1.2E+00	1/91	2.0E-05 RfD	1996	2.0E-05	7.0E-02	4/99	7.0E-02	10/00	1
PCB (POLYCHLORINATED BIPHENYLS) (unspeciated mixture) [low risk]★	1336-36-3			1.2E+00	1/91	2.0E-05 RfD	1996	1.1E-04	4.0E-01★		4.0E-01★		1
PCB (POLYCHLORINATED BIPHENYLS) (unspeciated mixture) [high risk]★	1336-36-3			1.2E+00	1/91	2.0E-05 RfD	1996	5.7E-04	2.0E+00	4/99	2.0E+00	10/00	1
PCB (POLYCHLORINATED BIPHENYLS (speciated) [v]													
3,3',4,4'-TETRACHLOROBIPHENYL (PCB 77)	32598-13-3			4.0E-01	8/03	1.0E-04	8/03	3.8E-03	1.3E+01	8/03	1.3E+01	8/03	1
3,4,4',5-TETRACHLOROBIPHENYL (PCB 81)	70362-50-4			4.0E-01	8/03	1.0E-04	8/03	3.8E-03	1.3E+01	8/03	1.3E+01	8/03	1
2,3,3',4,4'-PENTACHLOROBIPHENYL (PCB 105)	32598-14-4			4.0E-01	8/03	1.0E-04	8/03	3.8E-03	1.3E+01	8/03	1.3E+01	8/03	1
2,3,4,4',5-PENTACHLOROBIPHENYL (PCB 114)	74472-37-0			8.0E-02	8/03	2.0E-05	8/03	1.9E-02	6.5E+01	8/03	6.5E+01	8/03	1
2,3',4,4',5-PENTACHLOROBIPHENYL (PCB 118)	31508-00-6			4.0E-01	8/03	1.0E-04	8/03	3.8E-03	1.3E+01	8/03	1.3E+01	8/03	1
2,3',4,4',5'-PENTACHLOROBIPHENYL (PCB 123)	65510-44-3			4.0E-01	8/03	1.0E-04	8/03	3.8E-03	1.3E+01	8/03	1.3E+01	8/03	1
3,3',4,4',5-PENTACHLOROBIPHENYL (PCB 126)	57465-28-8			4.0E-04	8/03	1.0E-07	8/03	3.8E+00	1.3E+04	8/03	1.3E+04	8/03	1
2,3,3',4,4',5-HEXACHLOROBIPHENYL (PCB 156)	38380-08-4			8.0E-02	8/03	2.0E-05	8/03	1.9E-02	6.5E+01	8/03	6.5E+01	8/03	1
2,3,3',4,4',5'-HEXACHLOROBIPHENYL (PCB 157)	69782-90-7			8.0E-02	8/03	2.0E-05	8/03	1.9E-02	6.5E+01	8/03	6.5E+01	8/03	1
2,3',4,4',5,5'-HEXACHLOROBIPHENYL (PCB 167)	52663-72-6			4.0E+00	8/03	1.0E-03	8/03	3.8E-04	1.3E+00	8/03	1.3E+00	8/03	1
3,3',4,4',5,5'-HEXACHLOROBIPHENYL (PCB 169)	32774-16-6			4.0E-03	8/03	1.0E-06	8/03	3.8E-01	1.3E+03	8/03	1.3E+03	8/03	1
2,3,3',4,4',5,5'-HEPTACHLOROBIPHENYL (PCB 189)	39635-31-9			4.0E-01	8/03	1.0E-04	8/03	3.8E-03	1.3E+01	8/03	1.3E+01	8/03	1

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Chemical	Chemical Abstract Number	Noncancer Effects						Cancer Risk					
		Acute Inhalation ($\mu g/m^3$)	Date Value Reviewed [Added]	Chronic Inhalation ($\mu g/m^3$)	Date Value Reviewed [Added]	Chronic Oral (mg/kg/d)	Date Value Reviewed [Added]	Inhalation Unit Risk $(\mu g/m^3)^{-1}$	Inhalation Cancer Potency Factor $(mg/kg\text{-}d)^{-1}$	Date Value Reviewed [Added]	Oral Slope Factor $(mg/kg\text{-}d)^{-1}$	Date Value Reviewed [Added]	MWAF
POLYCHLORINATED DIBENZO-*P*-DIOXINS (PCDD) (AS 2,3,7,8-PCDD EQUIVALENT) TAC ●	1085 1086			4.0E-05	2/00	1.0E-08	10/00	3.8E+01 TAC	1.3E+05	8/86	1.3E+05 TAC	8/86	1
2,3,7,8-TETRACHLORODIBENZO-*P*-DIOXIN TAC	1746-01-6			4.0E-05	2/00	1.0E-08	10/00	3.8E+01 TAC	1.3E+05	8/86	1.3E+05 TAC	8/86	1
1,2,3,7,8-PENTACHLORODIBENZO-*P*-DIOXIN	40321-76-4			4.0E-05	8/03	1.0E-08	8/03	3.8E+01	1.3E+05	8/03	1.3E+05	8/03	1
1,2,3,4,7,8-HEXACHLORODIBENZO-*P*-DIOXIN	39227-28-6			4.0E-04	2/00	1.0E-07	10/00	3.8E+00	1.3E+04	4/99	1.3E+04	10/00	1
1,2,3,6,7,8-HEXACHLORODIBENZO-*P*-DIOXIN	57653-85-7			4.0E-04	2/00	1.0E-07	10/00	3.8E+00	1.3E+04	4/99	1.3E+04	10/00	1
1,2,3,7,8,9-HEXACHLORODIBENZO-*P*-DIOXIN	19408-74-3			4.0E-04	2/00	1.0E-07	10/00	3.8E+00	1.3E+04	4/99	1.3E+04	10/00	1
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-*P*-DIOXIN	35822-46-9			4.0E-03	2/00	1.0E-06	10/00	3.8E-01	1.3E+03	4/99	1.3E+03	10/00	1
1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-*P*-DIOXIN	3268-87-9			4.0E-01	8/03	1.0E-04	8/03	3.8E-03	1.3E+01	8/03	1.3E+01	8/03	1
POLYCHLORINATED DIBENZOFURANS (AS 2,3,7,8-PCDD EQUIVALENT) (PCDF) TAC ●	1080			4.0E-05	2/00	1.0E-08	10/00	3.8E+01 TAC	1.3E+05	8/86	1.3E+05 TAC	8/86	1
2,3,7,8-TETRACHLORODIBENZOFURAN	5120-73-19			4.0E-04	2/00	1.0E-07	10/00	3.8E+00	1.3E+04	4/99	1.3E+04	10/00	1
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6			8.0E-04	2/00	2.0E-07	10/00	1.9E+00	6.5E+03	4/99	6.5E+03	10/00	1
2,3,4,7,8-PENTACHLORODIBENZOFURAN	57117-31-4			8.0E-05	2/00	2.0E-08	10/00	1.9E+01	6.5E+04	4/99	6.5E+04	10/00	1
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9			4.0E-04	2/00	1.0E-07	10/00	3.8E+00	1.3E+04	4/99	1.3E+04	10/00	1
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9			4.0E-04	2/00	1.0E-07	10/00	3.8E+00	1.3E+04	4/99	1.3E+04	10/00	1
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9			4.0E-04	2/00	1.0E-07	10/00	3.8E+00	1.3E+04	4/99	1.3E+04	10/00	1
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5			4.0E-04	2/00	1.0E-07	10/00	3.8E+00	1.3E+04	4/99	1.3E+04	10/00	1
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4			4.0E-03	2/00	1.0E-06	10/00	3.8E-01	1.3E+03	4/99	1.3E+03	10/00	1
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7			4.0E-03	2/00	1.0E-06	10/00	3.8E-01	1.3E+03	4/99	1.3E+03	10/00	1
1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN	39001-02-0			4.0E-01	8/03	1.0E-04	8/03	3.8E-03	1.3E+01	8/03	1.3E+01	8/03	1
POLYCYCLIC AROMATIC HYDROCARBON (PAH)	1150 1151												
BENZ(A)ANTHRACENE ❖	56-55-3							1.1E-04	3.9E-01	4/99 [4/94]	1.2E+00	10/00 [4/94]	1

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Table 1
CONSOLIDATED TABLE OF OEHHA/ARB APPROVED RISK ASSESSMENT HEALTH VALUES

Chemical	Chemical Abstract Number	Noncancer Effects						Cancer Risk					
		Acute Inhalation ($\mu g/m^3$)	Date Value Reviewed [Added]	Chronic Inhalation ($\mu g/m^3$)	Date Value Reviewed [Added]	Chronic Oral (mg/kg/d)	Date Value Reviewed [Added]	Inhalation Unit Risk $(\mu g/m^3)^{-1}$	Inhalation Cancer Potency Factor $(mg/kg\text{-}d)^{-1}$	Date Value Reviewed [Added]	Oral Slope Factor $(mg/kg\text{-}d)^{-1}$	Date Value Reviewed [Added]	MWAF
BENZO(A)PYRENE	50-32-8							1.1E-03	3.9E+00	4/99 [4/94]	1.2E+01	10/00 [4/94]	1
BENZO(B)FLUORANTHENE	205-99-2							1.1E-04	3.9E-01	4/99 [4/94]	1.2E+00	10/00 [4/94]	1
BENZO(J)FLUORANTHENE	205-82-3							1.1E-04	3.9E-01	4/99 [4/94]	1.2E+00	10/00 [4/94]	1
BENZO(K)FLUORANTHENE	207-08-9							1.1E-04	3.9E-01	4/99 [4/94]	1.2E+00	10/00 [4/94]	1
CHRYSENE	218-01-9							1.1E-05	3.9E-02	4/99 [4/94]	1.2E-01	10/00 [4/94]	1
DIBENZ(A,H)ACRIDINE	226-36-8							1.1E-04	3.9E-01	4/99 [4/94]	1.2E+00	10/00 [4/9 4]	1
DIBENZ(A,H)ANTHRACENE	53-70-3							1.2E-03	4.1E+00	4/99 [4/94]	4.1E+00	10/00 [4/94]	1
DIBENZ(A,J)ACRIDINE	224-42-0							1.1E-04	3.9E-01	4/99 [4/94]	1.2E+00	10/00 [4/94]	1
DIBENZO(A,E)PYRENE	192-65-4							1.1E-03	3.9E+00	4/99 [4/94]	1.2E+01	10/00 [4/94]	1
DIBENZO(A,H)PYRENE	189-64-0							1.1E-02	3.9E+01	4/99 [4/94]	1.2E+02	10/00 [4/94]	1
DIBENZO(A,I)PYRENE	189-55-9							1.1E-02	3.9E+01	4/99 [4/94]	1.2E+02	10/00 [4/94]	1
DIBENZO(A,L)PYRENE	191-30-0							1.1E-02	3.9E+01	4/99 [4/94]	1.2E+02	10/00 [4/94]	1
7H-DIBENZO(C,G)CARBAZOLE	194-59-2							1.1E-03	3.9E+00	4/99 [4/94]	1.2E+01	10/00 [4/94]	1
7,12-DIMETHYLBENZ(A)ANTHRACENE	57-97-6							7.1E-02	2.5E+02	4/99 [4/94]	2.5E+02	10/00 [4/94]	1
1,6-DINITROPYRENE	42397-64-8							1.1E-02	3.9E+01	4/99 [4/94]	1.2E+02	10/00 [4/94]	1
1,8-DINITROPYRENE	42397-65-9							1.1E-03	3.9E+00	4/99 [4/94]	1.2E+01	10/00 [4/94]	1
INDENO(1,2,3-C,D)PYRENE	193-39-5							1.1E-04	3.9E-01	4/99 [4/94]	1.2E+00	10/00 [4/94]	1
3-METHYLCHOLANTHRENE	56-49-5							6.3E-03	2.2E+01	4/99 [4/94]	2.2E+01	10/00 [4/94]	1
5-METHYLCHRYSENE	3697-24-3							1.1E-03	3.9E+00	4/99 [4/94]	1.2E+01	10/00 [4/94]	1
NAPHTHALENE	91-20-3			9.0E+00	4/00								1
5-NITROACENAPHTHENE	602-87-9							3.7E-05	1.3E-01	4/99 [4/94]	1.3E-01	10/00 [4/94]	1
6-NITROCHRYSENE	7496-02-8							1.1E-02	3.9E+01	4/99 [4/94]	1.2E+02	10/00 [4/94]	1

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Table 1
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Chemical	Chemical Abstract Number	Noncancer Effects						Cancer Risk					
		Acute Inhalation ($\mu g/m^3$)	Date Value Reviewed [Added]	Chronic Inhalation ($\mu g/m^3$)	Date Value Reviewed [Added]	Chronic Oral (mg/kg/d)	Date Value Reviewed [Added]	Inhalation Unit Risk $(\mu g/m^3)^{-1}$	Inhalation Cancer Potency Factor $(mg/kg\text{-}d)^{-1}$	Date Value Reviewed [Added]	Oral Slope Factor $(mg/kg\text{-}d)^{-1}$	Date Value Reviewed [Added]	MWAF
2-NITROFLUORENE	607-57-8							1.1E-05	3.9E-02	4/99 [4/94]	1.2E-01	10/00 [4/94]	1
1-NITROPYRENE	5522-43-0							1.1E-04	3.9E-01	4/99 [4/94]	1.2E+00	10/00 [4/94]	1
4-NITROPYRENE	57835-92-4							1.1E-04	3.9E-01	4/99 [4/94]	1.2E+00	10/00 [4/94]	1
POTASSIUM BROMATE.... ... (see Bromine & Compounds)													
1,3-PROPANE SULTONE	1120-71-4							6.9E-04	2.4E+00	4/99			1
PROPYLENE (PROPENE)	115-07-1			3.0E+03	4/00								1
PROPYLENE GLYCOL MONOMETHYL ETHER	107-98-2			7.0E+03	2/00								1
PROPYLENE OXIDE	75-56-9	3.1E+03	4/99	3.0E+01	2/00			3.7E-06	1.3E-02	4/99 [7/90]			1
SELENIUM AND COMPOUNDS	7782-49-2 [1170]			2.0E+01	12/01								1
HYDROGEN SELENIDE	7783-07-5	5.0E+00	4/99										1
Selenium sulfide	*7446-34-6*			*2.0E+01*	*12/01*								*1*
SODIUM HYDROXIDE	1310-73-2	8.0E+00	4/99	4.8E+00	7/90								1
STYRENE	100-42-5	2.1E+04	4/99	9.0E+02	4/00								1
SULFATES	9960	1.2E+02	4/99	2.5E+01	1/92								1
SULFUR DIOXIDE	7446-09-5	6.6E+02	4/99[1/92]	6.6E+02	1/92								1
SULFURIC ACID AND OLEUM	7664-93-9	1.2E+02	4/99	*1.0E+00*	*12/01*								1
SULFURIC ACID	*7664-93-9*	*1.2E+02*	*4/99*	1.0E+00	12/01								*1*
SULFUR TRIOXIDE	*7446-71-9*	*1.2E+02*	*4/99*										*1*
OLEUM	*8014-95-7*	*1.2E+02*	*4/99*	*1.0E+00*	*12/01*								*1*
1,1,2,2-TETRACHLOROETHANE	79-34-5							5.8E-05	2.0E-01	4/99			1
TETRACHLOROPHENOLS ... (see Chlorophenols)													
2,4,5-TRICHLOROPHENOL ... (see Chlorophenols)													
2,4,6-TRICHLOROPHENOL ... (see Chlorophenols)													
THIOACETAMIDE	62-55-5							1.7E-03	6.1E+00	4/99			1
TOLUENE	108-88-3	3.7E+04	4/99	3.0E+02	4/00								1
Toluene diisocyantates	*26471-62-5 1204*			*7.0E-02*	*1/01*			*1.1E-05*	*3.9E-02*	*4/99*			*1*
TOLUENE-2,4-DIISOCYANATE	584-84-9			7.0E-02	1/01			1.1E-05	3.9E-02	4/99			1
TOLUENE-2,6-DIISOCYANATE	91-08-7			7.0E-02	1/01			1.1E-05	3.9E-02	4/99			1
1,1,2-TRICHLOROETHANE (Vinyl trichloride)	79-00-5							1.6E-05	5.7E-02	4/99			1

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Table 1
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Chemical	Chemical Abstract Number	Noncancer Effects						Cancer Risk					
		Acute Inhalation ($\mu g/m^3$)	Date Value Reviewed [Added]	Chronic Inhalation ($\mu g/m^3$)	Date Value Reviewed [Added]	Chronic Oral (mg/kg/d)	Date Value Reviewed [Added]	Inhalation Unit Risk $(\mu g/m^3)^{-1}$	Inhalation Cancer Potency Factor $(mg/kg\text{-}d)^{-1}$	Date Value Reviewed [Added]	Oral Slope Factor $(mg/kg\text{-}d)^{-1}$	Date Value Reviewed [Added]	MAF
TRICHLOROETHYLENE TAC	79-01-6			6.0E+02	4/00			2.0E-06 TAC	7.0E-03	10/90			1
TRIETHYLAMINE	121-44-8	2.8E+03	4/99	2.0E+02	9/02								1
URETHANE (Ethyl carbamate)	51-79-6							2.9E-04	1.0E+00	4/99 [7/90]			1
Vanadium Compounds	*N/A*												*1*
Vanadium (fume or dust)	*7440-62-2*	*3.0E+01*	*4/99*										*1*
VANADIUM PENTOXIDE	1314-62-1	3.0E+01	4/99										1
VINYL ACETATE	108-05-4			2.0E+02	12/01								1
VINYL BROMIDE	593-60-2			7.0E+00 RfC	1996								1
VINYL CHLORIDE TAC (Chloroethylene)	75-01-4	1.8E+05	4/99	2.6E+01	7/90			7.8E-05 TAC	2.7E-01	12/90			1
VINYLIDENE CHLORIDE (1,1-Dichloroethylene)	75-35-4			7.0E+01	1/01								1
XYLENES (mixed isomers)	1330-20-7 1210	2.2E+04	4/99	7.0E+02	4/00								1
m-XYLENE	108-38-3	2.2E+04	4/99	7.0E+02	4/00								1
o-XYLENE	95-47-6	2.2E+04	4/99	7.0E+02	4/00								1
p-XYLENE	106-42-3	2.2E+04	4/99	7.0E+02	4/00								1
ZINC AND COMPOUNDS	7440-66-6 [1211]			3.5E+01	7/90								1
Zinc oxide	*1314-13-2*			*3.5E+01*	*7/90*								*0.8034*

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Table 1
CONSOLIDATED TABLE OF OEHHA/ARB APPROVED RISK ASSESSMENT HEALTH VALUES[❁]

Purpose:	The purpose of this reference table is to provide a quick list of all health values that have been approved by the Office of Environmental Health Hazard Assessment (OEHHA) and the Air Resources Board (ARB) for use in facility health risk assessments conducted for the AB 2588 Air Toxics Hot Spots Program. The OEHHA has developed and adopted new risk assessment guidelines that update and replace the California Air Pollution Control Officers Association's (CAPCOA) *Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines, October 1993.* The OEHHA has adopted five technical support documents for these guidelines. This table lists the OEHHA adopted inhalation and oral cancer slope factors, noncancer acute Reference Exposure Levels (RELs), and inhalation and oral noncancer chronic RELs. In addition, it lists the substances in Appendix A-I *(Substances For Which Emissions Must Be Quantified)* and Appendix F (*Criteria For Inputs For Risk Assessment Using Screening Air Dispersion Modeling*) of the ARB's *Air Toxics "Hot Spots" Emission Inventory Criteria and Guidelines (EICG) (July 1997).* OEHHA is still in the process of adopting new noncancer chronic RELs. Therefore, new health values will periodically be added to, or deleted from, this table. Users of this table are advised to monitor the OEHHA website (*www.oehha.ca.gov*) for any updates to the health values.
❁	Substances written in *italics* do not have explicit OEHHA approved health values, but are included in this table to clarify applicability of OEHHA adopted heath effects values to individual or grouped substances listed in the *Air Toxics "Hot Spots" Emission Inventory Criteria and Guidelines*, Appendix A-I list of *"Substances For Which Emissions Must Be Quantified".*
▼	Chemical Abstract Service Number (CAS): For chemical groupings and mixtures where a CAS number is not applicable, the 4-digit code used in the *Air Toxics "Hot Spots" Emission Inventory Criteria and Guidelines (EICG) Report* is listed. The 4-digit codes enclosed in brackets [ ] are codes that have been phased out, but may still appear on previously reported Hot Spots emissions. For information on the origin and use of the 4-digit code, see the EICG report.
◆	Date Value Reviewed [Added]: These columns list the date that the health value was last reviewed by OEHHA and the Scientific Review Panel, and/or approved for use in the AB 2588 Air Toxics Hot Spots Program. If the health value is unchanged since it was first approved for use in the Hot Spots Program, then the date that the value was first approved for use by CAPCOA is listed within the brackets [ ]. • April 1999 is listed for the cancer potency values and noncancer acute RELs, which have been adopted by the OEHHA as part of the AB 2588 Hot Spot Risk Assessment Guidelines. • February 2000, April 2000, January 2001, and December 2001 are listed for the first set of 22, the second set of 16, the third set of 22, and the fourth set of 12 noncancer chronic RELs, respectively. The chronic REL for carbon disulfide was adopted in May 2002. Chronic RELs for phosphine and triethylamine were adopted in September 2002. Chronic RELs for fluorides including hydrogen fluoride were adopted August 2003. • October 2000 is listed for the oral chronic RELs and oral cancer slope factors. 1996 is listed for the U.S. EPA Reference Concentrations. Dates of 1990-1992 and 1996 are listed for chronic RELs that may eventually be dropped or replaced. • For the substances identified as Toxic Air Contaminants, the Air Resources Board hearing date is listed. The dates for acetaldehyde, benzo[a]pyrene, and methyl tertiary-butyl ether represent the dates the values were approved by the Scientific Review Panel.
❣	Inhalation cancer potency factor: The "unit risk factor" has been replaced in the new risk assessment algorithms by a factor called the "inhalation cancer potency factor". Inhalation cancer potency factors are expressed as units of inverse dose [i.e., $(mg/kg\text{-}day)^{-1}$]. They were derived from unit risk factors [units = $(ug/m^3)^{-1}$] by assuming that a receptor weighs 70 kilograms and breathes 20 cubic meters of air per day. The inhalation potency factor is used to calculate a potential inhalation cancer risk using the new risk assessment algorithms defined in the OEHHA, *Air Toxics Hot Spots Program; Part IV; Technical Support Document for Exposure Assessment and Stochastic Analysis (September 2000)*.
♣	Molecular Weight Adjustment Factor: Molecular weight adjustment factors (MWAF) are only to be used when a toxic metal has a cancer potency factor. For most of the Hot Spots toxic metals, the OEHHA cancer potency factor applies to the weight of the toxic metal atom contained in the overall compound. Some of the Hot Spots compounds contain various elements along with the toxic metal atom (e.g., "Nickel hydroxide", CAS number 12054-48-7, has a formula of H_2NiO_2). Therefore, an adjustment to the reported pounds of the overall compound is needed before applying the OEHHA cancer potency factor for "Nickel and compounds" to such a compound. This ensures that the cancer potency factor is applied only to the fraction of the overall weight of the emissions that are associated with health effects of the metal. In other cases, the Hot Spots metals are already reported as the metal atom equivalent (e.g., CAS 7440-02-0, "Nickel"), and these cases do not use any further molecular weight adjustment. (Refer to Note [7] in Appendix A, List of Substances in the EICG Report for further information on how the emissions of various Hot Spots metal compounds are reported.) The appropriate molecular weight adjustment factors (MWAF) to be used along with the OEHHA cancer potency factors for Hot Spots metals can be found in the MWAF column of this table. So, for example, assume 100 pounds of "Nickel hydroxide" emissions are reported under CAS number 12054-48-7. To get the Nickel atom equivalent of these emissions, multiply by the listed MWAF (0.6332) for Nickel hydroxide: • 100 pounds x 0.6332 = 63.32 pounds of Nickel atom equivalent *This step should be completed prior to applying the OEHHA cancer potency factor for "Nickel and compounds" in a calculation for a prioritization score or risk assessment calculation.* (For more information see Chapter 8 of OEHHA's document, *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*.) Note: The value listed in the MWAF column for Asbestos is not a molecular weight adjustment. This is a conversion factor for adjusting mass to fibers or structures. See Appendix C of OEHHA's document *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* for more information on Asbestos, or see the EICG report for reporting guidance. Also see the Asbestos footnote (designated by the symbol ⌑)
N/A	Not Applicable

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Table 1

CONSOLIDATED TABLE OF OEHHA/ARB APPROVED RISK ASSESSMENT HEALTH VALUES

RfC/RfD	United States Environmental Protection Agency (U.S. EPA) Reference Concentrations (RfCs) and oral Reference Doses (RfDs) from the U.S. EPA Integrated Risk Information System (1996) have been added if the U.S. EPA health value and/or endpoint was different from the 1993 CAPCOA value or endpoint and OEHHA has not adopted a new value as part of the Hot Spot Risk Assessment Guidelines. The RfCs and RfDs listed meet the criteria of Appendix F of the Air Resources Board's Emission Inventory Criteria and Guidelines Report effective July 1, 1997. These RfC/RfDs may be replaced by new OEHHA values in the future.
TAC	Toxic Air Contaminant: The Air Resources Board has identified this substance as a Toxic Air Contaminant.
AveP	The averaging period of noncancer acute RELs is generally a one-hour exposure. However, some are based on several hour exposure for reproductive/developmental endpoints (see section 1.6 of OEHHA's technical support document for *The Determination of Acute Reference Exposure Levels for Airborne Toxicants, March 1999).* Typically the RELs for the following substances are compared to modeled emission concentrations of the same duration rather than maximum one-hour concentrations (e.g., a 4-hour REL should be compared to the maximum 4-hour average concentration from the air dispersion model). 4-Hour: Arsenic and Inorganic Arsenic Compounds 6-Hour: Benzene, Carbon disulfide, Ethylene glycol monoethyl ether, Ethylene glycol monoethyl ether acetate, Ethylene glycol monomethyl ether 7-Hour: Carbon tetrachloride, Chloroform
¤	Asbestos: The units for the Inhalation Cancer Potency factor for asbestos are $(100 \text{ PCM fibers/m}^3)^{-1}$. A conversion factor of 100 fibers/0.003 µg can be multiplied by a receptor concentration of asbestos expressed in $\mu g/m^3$. Unless other information necessary to estimate the concentration (fibers/m^3) of asbestos at receptors of interest is available. A unit risk factor of $1.9 \text{ E } 10^{-4}$ $(\mu g/m^3)^{-1}$ and an inhalation cancer potency factor of $2.2 \text{ E } 10^{+2}$ $(\text{mg/kg BW} * \text{day})^{-1}$ are available. For more information on asbestos quantity conversion factors, see Appendix C of OEHHA's *The Air Toxics Hot Spots Program Risk Assessment Guidelines; Part II; Technical Support Document for Describing Available Cancer Potency Factors*, and Appendix C of OEHHA's document *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*.
∅	Hexavalent Chromium: The oral cancer slope factor for chromium 6+ and compounds has been withdrawn by the Office of Environmental Health Hazard Assessment.
✳	Inorganic Lead: Inorganic Lead was identified by the Air Resources Board as a Toxic Air Contaminant in April 1997. Since information on noncancer health effects show no identified threshold, no Reference Exposure Level has been developed. The document, *Risk Management Guidelines for New, Modified, and Existing Sources of Lead, March 2001*, has been developed by ARB and OEHHA staff for assessing noncancer health impacts from sources of lead. See Appendix F of OEHHA's document *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* for an overview of how to evaluate noncancer impacts from exposure to lead using these risk management guidelines.
❖	Polycyclic Aromatic Hydrocarbons (PAHs): These substances are PAH or PAH-derivatives that have OEHHA-developed Potency Equivalency Factors (PEFs) which were approved by the Scientific Review Panel in April 1994 (see ARB document entitled *Benzo[a]pyrene as a Toxic Air Contaminant*). PAH inhalation slope factors listed here have been adjusted by the PEFs. See Appendix G of OEHHA's document *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* for more information.
★	Polychlorinated Biphenyls: (unspeciated mixtures) Lowest Risk: For use in cases where congeners with more than four chlorines comprise less than one-half percent of total polychlorinated biphenyls. High Risk: For use in cases where congeners with more than four chlorines do not comprise less than one-half percent of total polychlorinated biphenyls. Low Risk: This number would not ordinarily be used in the Hot Spots program. Chronic Oral: The chronic oral value is U.S. EPA's 1996 oral Reference Dose for Aroclor-1254.
V	Polychlorinated Biphenyls (speciated): Values calculated using WHO_{97} TEF procedure. See OEHHA memo dated August 29, 2003.
•	Polychlorinated Dibenzo-*p*-dioxins and Polychlorinated Dibenzofurans (also referred to as chlorinated dioxins and dibenzofurans): The OEHHA has adopted the World Health Organization 1997 (WHO_{97}) Toxicity Equivalency Factor scheme for evaluating the cancer risk due to exposure to samples containing mixtures of polychlorinated dibenzo-*p*-dioxins (PCDD) and polychlorinated dibenzofurans (PCDF) and determining cancer risks for a number of specific PCB congeners. See Appendix A of OEHHA's *Technical Support Document For Describing Available Cancer Potency Factors* for more information about the scheme. See Appendix E of OEHHA's *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* for the methodology for calculating 2,3,7,8-equivalents for PCDD, PCDFs and a number of specific PCB congeners.
■	Particulate Emissions from Diesel-Fueled Engines: The inhalation cancer potency factor and chronic REL were derived from whole diesel exhaust and should be used only for impacts from the inhalation pathway. The inhalation impacts from speciated emissions from diesel-fueled engines are already accounted for in the inhalation cancer potency factor and REL. However, at the discretion of the risk assessor, speciated emissions from diesel-fueled engines may be used to estimate acute noncancer health impacts or the contribution to cancer risk or chronic noncancer health impacts for the non-inhalation exposure pathway. See Appendix D of OEHHA's document *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* for more information.

Table last updated: November 19, 2003

Table last updated: December 4, 2003

Table 2
OEHHA/ARB APPROVED ACUTE REFERENCE EXPOSURE LEVELS AND TARGET ORGANS

Substance	Chemical Abstract Service Number (CAS)	Acute REL ($\mu g/m^3$)	Date Value Reviewed	Target Organs									
				Alimentary Tract	Cardiovascular	Developmental	Eye	Hematologic	Immune	Nervous	Reproductive	Respiratory	Skin
ACROLEIN	107-02-8	1.9E-01	4/99				X					X	
ACRYLIC ACID	79-10-7	6.0E+03	4/99				X					X	
AMMONIA	7664-41-7	3.2E+03	4/99				X					X	
ARSENIC AND COMPOUNDS (INORGANIC) TAC	7440-38-2 1016 [1015]	1.9E-01 AveP	4/99			X					X		
ARSINE	7784-42-1	1.6E+02	4/99					X					
BENZENE TAC	71-43-2	1.3E+03 AveP	4/99			X		X	X		X		
BENZYL CHLORIDE	100-44-7	2.4E+02	4/99				X					X	
CARBON DISULFIDE	75-15-0	6.2E+03 AveP	4/99			X				X	X		
CARBON MONOXIDE	630-08-0	2.3E+04	4/99		X								
CARBON TETRACHLORIDE TAC (Tetrachloromethane)	56-23-5	1.9E+03 AveP	4/99	X		X				X	X		
CHLORINE	7782-50-5	2.1E+02	4/99				X					X	
CHLOROFORM TAC	67-66-3	1.5E+02 AveP	4/99			X				X	X		
CHLOROPICRIN	76-06-2	2.9E+01	4/99				X					X	
COPPER AND COMPOUNDS	7440-50-8 [1067]	1.0E+02	4/99									X	
Cyanide Compounds (inorganic)	*57-12-5 1073*	*3.4E+02*	*4/99*							✓			
HYDROGEN CYANIDE (Hydrocyanic acid)	74-90-8	3.4E+02	4/99							X			
1,4-DIOXANE ✣ (1,4-Diethylene dioxide)	123-91-1	3.0E+03	4/99				X					X	
EPICHLOROHYDRIN (1-Chloro-2,3-epoxypropane)	106-89-8	1.3E+03	4/99				X					X	
Fluorides and Compounds	*1101*	*2.4E+02*	*4/99*				✓					✓	
HYDROGEN FLUORIDE (Hydrofluoric acid)	7664-39-3	2.4E+02	4/99				X					X	
FORMALDEHYDE TAC	50-00-0	9.4E+01	4/99				X		X			X	
GLYCOL ETHERS	1115												
ETHYLENE GLYCOL BUTYL ETHER – EGBE	111-76-2	1.4E+04	4/99				X					X	
ETHYLENE GLYCOL ETHYL ETHER – EGEE	110-80-5	3.7E+02 AveP	4/99 [1/92]			X					X		
ETHYLENE GLYCOL ETHYL ETHER ACETATE - EGEEA	111-15-9	1.4E+02 AveP	4/99			X				X	X		
ETHYLENE GLYCOL METHYL ETHER – EGME	109-86-4	9.3E+01 AveP	4/99			X					X		

Table last updated: December 4, 2003

Table 2
OEHHA/ARB APPROVED ACUTE REFERENCE EXPOSURE LEVELS AND TARGET ORGANS

Substance	Chemical Abstract Service Number (CAS)	Acute REL ($\mu g/m^3$)	Date Value Reviewed	Target Organs									
				Alimentary Tract	Cardiovascular	Developmental	Eye	Hematologic	Immune	Nervous	Reproductive	Respiratory	Skin
HYDROCHLORIC ACID (Hydrogen chloride)	7647-01-0	2.1E+03	4/99				X					X	
HYDROGEN CYANIDE (Hydrocyanic acid) ... (see Cyanide Compounds)													
HYDROGEN FLUORIDE (Hydrofluoric acid) ... (see Fluorides & Compounds)													
HYDROGEN SELENIDE ... (see Selenium & Compounds)													
HYDROGEN SULFIDE	7783-06-4	4.2E+01	4/99 [7/90]							X			
ISOPROPYL ALCOHOL (Isopropanol)	67-63-0	3.2E+03	4/99				X					X	
MERCURY AND COMPOUNDS (INORGANIC)	7439-97-6 [1133]	1.8E+00	4/99			X					X		
Mercuric chloride	*7487-94-7*	*1.8E+00*	*4/99*			✓					✓		
METHANOL	67-56-1	2.8E+04	4/99							X			
METHYL BROMIDE (Bromomethane)	74-83-9	3.9E+03	4/99			X				X	X	X	
METHYL CHLOROFORM (1,1,1-Trichloroethane)	71-55-6	6.8E+04	4/99							X			
METHYL ETHYL KETONE (2-Butanone)	78-93-3	1.3E+04	4/99				X					X	
METHYLENE CHLORIDE[TAC] (Dichloromethane)	75-09-2	1.4E+04	4/99							X			
NICKEL AND COMPOUNDS[TAC]	7440-02-0 [1145]	6.0E+00	4/99						X			X	
Nickel acetate,	*373-02-4*	*6.0E+00*	*4/99*						✓			✓	
Nickel carbonate	*3333-39-3*	*6.0E+00*	*4/99*						✓			✓	
Nickel carbonyl	*13463-39-3*	*6.0E+00*	*4/99*						✓			✓	
Nickel hydroxide	*12054-48-7*	*6.0E+00*	*4/99*						✓			✓	
Nickelocene	*1271-28-9*	*6.0E+00*	*4/99*						✓			✓	
NICKEL OXIDE	1313-99-1	6.0E+00	4/99						X			X	
Nickel refinery dust from the pyrometallurgical process	*1146*	*6.0E+00*	*4/99*						✓			✓	
Nickel subsulfide	*12035-72-2*	*6.0E+00*	*4/99*						✓			✓	
NITRIC ACID	7697-37-2	8.6E+01	4/99									X	
NITROGEN DIOXIDE	10102-44-0	4.7E+02	4/99 [1/92]									X	
OZONE	10028-15-6	1.8E+02	4/99 [1/92]				X					X	
PERCHLOROETHYLENE[TAC] (Tetrachloroethylene)	127-18-4	2.0E+04	4/99				X			X		X	

Table last updated: December 4, 2003

Table 2
OEHHA/ARB APPROVED ACUTE REFERENCE EXPOSURE LEVELS AND TARGET ORGANS

Substance	Chemical Abstract Service Number (CAS)	Acute REL ($\mu g/m^3$)	Date Value Reviewed	Target Organs									
				Alimentary Tract	Cardiovascular	Developmental	Eye	Hematologic	Immune	Nervous	Reproductive	Respiratory	Skin
PHENOL	108-95-2	5.8E+03	4/99				X					X	
PHOSGENE	75-44-5	4.0E+00	4/99									X	
PROPYLENE OXIDE	75-56-9	3.1E+03	4/99			X	X				X	X	
Selenium and Compounds	*7782-49-2 [1170]*												
HYDROGEN SELENIDE	7783-07-5	5.0E+00	4/99				X					X	
SODIUM HYDROXIDE	1310-73-2	8.0E+00	4/99				X					X	X
STYRENE	100-42-5	2.1E+04	4/99				X					X	
SULFATES	9960	1.2E+02	4/99									X	
SULFUR DIOXIDE	7446-09-5	6.6E+02	4/99 [1/92]									X	
SULFURIC ACID AND OLEUM	7664-93-9	1.2E+02	4/99									X	
SULFURIC ACID	*7664-93-9*	*1.2E+02*	*4/99*									✓	
SULFUR TRIOXIDE	*7446-71-9*	*1.2E+02*	*4/99*									✓	
OLEUM	*8014-95-7*	*1.2E+02*	*4/99*									✓	
TOLUENE	108-88-3	3.7E+04	4/99			X	X			X	X	X	
TRIETHYLAMINE	121-44-8	2.8E+03	4/99				X			X			
Vanadium Compounds	*N/A*												
Vanadium (fume or dust)	*7440-62-2*	*3.0E+01*	*4/99*				✓					✓	
VANADIUM PENTOXIDE	1314-62-1	3.0E+01	4/99				X					X	
VINYL CHLORIDE[TAC] (Chloroethylene)	75-01-4	1.8E+05	4/99				X			X		X	
XYLENES (mixed isomers)	1330-20-7 1210	2.2E+04	4/99				X					X	
m-Xylene	108-38-3	2.2E+04	4/99				X					X	
o-Xylene	95-47-6	2.2E+04	4/99				X					X	
p-Xylene	106-42-3	2.2E+04	4/99				X					X	

Table last updated: December 4, 2003

Table 2
OEHHA/ARB APPROVED ACUTE REFERENCE EXPOSURE LEVELS AND TARGET ORGANS[❁]

Purpose:	The purpose of this reference table is to provide a quick list of all health values that have been approved by the Office of Environmental Health Hazard Assessment (OEHHA) and the Air Resources Board (ARB) for use in facility health risk assessments conducted for the AB 2588 Air Toxics Hot Spots Program. The OEHHA has developed and adopted new risk assessment guidelines that update and replace the California Air Pollution Control Officers Association's (CAPCOA) *Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines, October 1993*. The OEHHA has adopted five technical support documents for these guidelines. This table lists the OEHHA adopted inhalation noncancer acute RELs. In addition, it lists the substances in Appendix A-I *(Substances For Which Emissions Must Be Quantified*) and Appendix F (*Criteria For Inputs For Risk Assessment Using Screening Air Dispersion Modeling*) of the ARB's *Air Toxics "Hot Spots" Emission Inventory Criteria and Guidelines (EICG) (July 1997)*. OEHHA is still in the process of adopting new noncancer chronic RELs. Therefore, new health values will periodically be added to, or deleted from, this table. Users of this table are advised to monitor the OEHHA website (*www.oehha.ca.gov*) for any updates to the health values.
❁	Substances written in *italics* and with a ✓ do not have explicit OEHHA approved health values, but are included in this table to clarify applicability of OEHHA adopted heath effects values to individual or grouped substances listed in the *Air Toxics "Hot Spots" Emission Inventory Criteria and Guidelines*, Appendix A-I list of *"Substances For Which Emissions Must Be Quantified"*.
▼	Chemical Abstract Service Number (CAS): For chemical groupings and mixtures where a CAS number is not applicable, the 4-digit code used in the *Air Toxics "Hot Spots" Emission Inventory Criteria and Guidelines (EICG) Report* is listed. The 4-digit codes enclosed in brackets [ ] are codes that have been phased out, but may still appear on previously reported Hot Spots emissions. For information on the origin and use of the 4-digit code, see the EICG report.
◆	Date Value Reviewed [Added]: This column lists the date that the health value was last reviewed by OEHHA and the Scientific Review Panel, and/or approved for use in the AB 2588 Air Toxics Hot Spots Program. If the health value is unchanged since it was first approved for use in the "Hot Spots" Program, then the date that the value was first approved for use by CAPCOA is listed within the brackets [ ]. • April 1999 is listed for the noncancer acute RELs which have been adopted by the OEHHA as part of the AB 2588 Hot Spot Risk Assessment Guidelines.
TAC	Toxic Air Contaminant: The Air Resources Board has identified this substance as a Toxic Air Contaminant.
AveP	The averaging period of noncancer acute RELs is generally a one-hour exposure. However, some are based on several hour exposure for reproductive/developmental endpoints (see section 1.6 of OEHHA's technical support document for *The Determination of Acute Reference Exposure Levels for Airborne Toxicants, March 1999).* Typically the RELs for the following substances are compared to modeled emission concentrations of the same duration rather than maximum one-hour concentrations (e.g., a 4-hour REL should be compared to the maximum 4-hour average concentration from the air dispersion model). 4-Hour: Arsenic and Inorganic Arsenic Compounds 6-Hour: Benzene, Carbon disulfide, Ethylene glycol ethyl ether, Ethylene glycol ethyl ether acetate, Ethylene glycol methyl ether 7-Hour: Carbon tetrachloride, Chloroform

Table last updated: December 4, 2003

Table last updated: December 4, 2003

Table 3
OEHHA/ARB APPROVED CHRONIC REFERENCE EXPOSURE LEVELS AND TARGET ORGANS[◉]

Chemical	Chemical▼ Abstract Number	Chronic Inhalation REL ($\mu g/m^3$)	Chronic Oral REL	Date◆ Value Reviewed [Added]	Target Organs												
					Alimentary	Bone	Cardiovascular	Developmental	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Reproductive	Respiratory	Skin
ACETALDEHYDE	75-07-0	9.0E+00		5/93												X	
ACROLEIN	107-02-8	6.0E-02		1/01						X						X	
ACRYLAMIDE	79-06-1	7.0E-01		1/91										X			
ACRYLIC ACID	79-10-7	1.0E+00[RfC]		1996												X	
ACRYLONITRILE	107-13-1	5.0E+00		12/01												X	
ALLYL CHLORIDE	107-05-1	1.0E+00[RfC]		1996										X			
AMMONIA	7664-41-7	2.0E+02		2/00												X	
ANILINE	62-53-3	1.0E+00[RfC]		1996			X										
Antimony Compounds	*7440-36-0*	*2.0E-01*[RfC]		*1996*												✓	
ANTIMONY TRIOXIDE	1309-64-4	2.0E-01[RfC]		1996												X	
ARSENIC AND COMPOUNDS (INORGANIC)[TAC]	7440-38-2 1016 [1015]	3.0E-02		1/01			X	X						X			
			3.0E-04	10/00			X										X
ARSINE	7784-42-1	5.0E-02[RfC]		1996			X										
BENZENE[TAC]	71-43-2	6.0E+01		2/00				X			X			X			
BENZIDINE (AND ITS SALTS) *values also apply to:*	92-87-5	1.0E+01		1/91	X									X			
Benzidine based dyes	*1020*	*1.0E+01*		*1/91*	✓									✓			
Direct Black 38	*1937-37-7*	*1.0E+01*		*1/91*	✓									✓			
Direct Blue 6	*2602-46-2*	*1.0E+01*		*1/91*	✓									✓			
Direct Brown 95 (technical grade)	*16071-86-6*	*1.0E+01*		*1/91*	✓									✓			
BENZYL CHLORIDE	100-44-7	1.2E+01		1/92												X	
BERYLLIUM AND COMPOUNDS	7440-41-7 [1021]	7.0E-03		12/01								X				X	
			2.0E-03	12/01	X												
BROMINE AND COMPOUNDS	7726-95-6 [1040]	1.7E+00		1/92												X	
BROMINE PENTAFLUORIDE	7789-30-2	1.7E+00		1/92	X								X			X	
HYDROGEN BROMIDE	10035-10-6	2.4E+01		1/92												X	
Potassium Bromate	*7758-01-2*	*1.7E+00*		1/92												✓	
1,3-BUTADIENE[TAC]	106-99-0	2.0E+01		1/01											X		

Table 3
OEHHA/ARB APPROVED CHRONIC REFERENCE EXPOSURE LEVELS AND TARGET ORGANS

Chemical	Chemical Abstract Number	Chronic Inhalation REL ($\mu g/m^3$)	Chronic Oral REL	Date Value Reviewed [Added]	Target Organs												
					Alimentary	Bone	Cardiovascular	Developmental	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Reproductive	Respiratory	Skin
CADMIUM AND COMPOUNDS[T7AC]	7440-43-9 [1045]	2.0E-02		1/01									X			X	
			5.0E-04	10/00									X				
CARBON DISULFIDE	75-15-0	8.0E+02		5/02										X	X		
CARBON TETRACHLORIDE[TAC] (Tetrachloromethane)	56-23-5	4.0E+01		1/01	X			X						X			
CHLORINE	7782-50-5	2.0E-01		2/00												X	
CHLORINE DIOXIDE	10049-04-4	6.0E-01		1/01												X	
2-CHLOROACETOPHENONE	532-27-4	3.0E-02[RfC]		1996												X	
CHLOROBENZENE	108-90-7	1.0E+03		1/01	X								X		X		
CHLOROFORM[TAC]	67-66-3	3.0E+02		4/00	X			X					X				
Chlorophenols	*1060*																
2-CHLOROPHENOL	95-57-8	1.8E+01		1/91	X			X*							X*		
PENTACHLOROPHENOL	87-86-5	2.0E-01		1/92	X			X*							X*		
TETRACHLOROPHENOLS	25167-83-3	8.8E+01		1/92	X			X*							X*		
2,3,4,6-Tetrachlorophenol	*58-90-2*	*8.8E+01*		*1/92*	✓			✓*							✓*		
CHLOROPICRIN	76-06-2	4.0E-01		12/01												X	
CHLOROPRENE	126-99-8	1.0E+00		192										X			
CHROMIUM 6+[TAC]	18540-29-9	2.0E-01		1/01												X	
			2.0E-02	10/00							X						
Barium chromate	*10294-40-3*	*2.0E-01*		*1/01*												✓	
			2.0E-02	*10/00*							✓						
Calcium chromate	*13765-19-0*	*2.0E-01*		*1/01*												✓	
			2.0E-02	*10/00*							✓						
Lead chromate	*7758-97-6*	*2.0E-01*		*1/01*												✓	
			2.0E-02	*10/00*							✓						
Sodium dichromate	*10588-01-9*	*2.0E-01*		*1/01*												✓	
			2.0E-02	*10/00*							✓						
Strontium chromate	*7789-06-2*	*2.0E-01*		*1/01*												✓	
			2.0E-02	*10/00*							✓						

Table 3
OEHHA/ARB APPROVED CHRONIC REFERENCE EXPOSURE LEVELS AND TARGET ORGANS[◉]

Chemical	Chemical▼ Abstract Number	Chronic Inhalation REL ($\mu g/m^3$)	Chronic Oral REL	Date◆ Value Reviewed [Added]	Target Organs												
					Alimentary	Bone	Cardiovascular	Developmental	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Reproductive	Respiratory	Skin
CHROMIUM TRIOXIDE (as chromic acid mist)	1333-82-0	2.0E-03		1/01												X	
			2.0E-02	*10/00*							✓						
COPPER AND COMPOUNDS	7440-50-8 [1067]	2.4E+00		1/92												X	
CRESOLS (mixtures of)	1319-77-3	6.0E+02		1/01										X			
m-CRESOL	108-39-4	6.0E+02		1/01										X			
o-CRESOL	95-48-7	6.0E+02		1/01										X			
p-CRESOL	106-44-5	6.0E+02		1/01										X			
Cyanide Compounds (inorganic)	*57-12-5 1073*	*9.0E+00*		*4/00*			✓		✓					✓			
HYDROGEN CYANIDE (Hydrocyanic acid)	74-90-8	9.0E+00		4/00			X		X					X			
1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	96-12-8	2.0E-01		1/92	X			X*							X*	X	
p-DICHLOROBENZENE	106-46-7	8.0E+02		1/01	X								X	X		X	
1,1,-DICHLOROETHYLENE … (see Vinylidene Chloride)																	
DI(2-ETHYLHEXYL)PHTHALATE (DEHP)	117-81-7	7.0E+01		1/91	X												
DIESEL EXHAUST … (see Particulate Emissions from Diesel-Fueled Engines)																	
DIETHANOLAMINE	111-42-2	3.0E+00		12/01			X							X			
N,N-DIMETHYL FORMAMIDE	68-12-2	8.0E+01		1/01	X											X	
1,4-DIOXANE✣ (1,4-Diethylene dioxide)	123-91-1	3.0E+03		4/00	X		X						X				
EPICHLOROHYDRIN (1-Chloro-2,3-epoxypropane)	106-89-8	3.0E+00		1/01						X						X	
1,2-EPOXYBUTANE	106-88-7	2.0E+01		1/01			X									X	
ETHYL ACRYLATE	140-88-5	4.8E+01		1/92	X								X			X	
ETHYL BENZENE	100-41-4	2.0E+03		2/00	X			X	X				X				
ETHYL CHLORIDE (Chlorethane)	75-00-3	3.0E+04		4/00	X			X									
ETHYLENE DIBROMIDE[TAC] (1,2-Dibromoethane)	106-93-4	8.0E-01		12/01											X		
ETHYLENE DICHLORIDE[TAC] (1,2-Dichloroethane)	107-06-2	4.0E+02		1/01	X												
ETHYLENE GLYCOL	107-21-1	4.0E+02		4/00				X					X			X	
ETHYLENE OXIDE[TAC] (1,2-Epoxyethane)	75-21-8	3.0E+01		1/01										X			

Table 3
OEHHA/ARB APPROVED CHRONIC REFERENCE EXPOSURE LEVELS AND TARGET ORGANS[◉]

Chemical	Chemical▼ Abstract Number	Chronic Inhalation REL ($\mu g/m^3$)	Chronic Oral REL	Date◆ Value Reviewed [Added]	Target Organs													
					Alimentary	Bone	Cardiovascular	Developmental	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Reproductive	Respiratory	Skin
Fluorides	1101	1.3E+01				X										X	
			4.0E-02	8/03		X											
HYDROGEN FLUORIDE (Hydrofluoric acid)	7664-39-3	1.4E+01				X										X	
			4.0E-02	8/03		X											
FLUOROCARBONS (chlorinated)	1104 [1105]	7.0E+02		1/91										X			
Chlorinated fluorocarbon (CFC-113)	*76-13-1*	*7.0E+02*		*1/91*										✓			
CHLORODIFLUOROMETHANE (Freon 22)	75-45-6	5.0E+04[RfC]		1996				X	X				X				
Dichlorofluoromnethane (Freon 12)	*75-43-4*	*7.0E+02*		*1/91*										✓			
Trichlorofluoromethane (Freon 11)	*75-69-4*	*7.0E+02*		*1/91*										✓			
Fluorocarbons (brominated)	*1103*	*7.0E+02*		*1/91*										✓			
FORMALDEHYDE[TAC]	50-00-0	3.0E+00		2/00						X						X	
GASOLINE VAPORS	1110	2.1E+03		1/91										X		X	
GLUTARALDEHYDE	111-30-8	8.0E-02		1/01												X	
GLYCOL ETHERS	1115																
ETHYLENE GLYCOL BUTYL ETHER – EGBE	111-76-2	2.0E+01		1/92				X*							X*	X	
ETHYLENE GLYCOL ETHYL ETHER – EGEE	110-80-5	7.0E+01		2/00							X				X		
ETHYLENE GLYCOL ETHYL ETHER ACETATE - EGEEA	111-15-9	3.0E+02		2/00				X									
ETHYLENE GLYCOL METHYL ETHER – EGME	109-86-4	6.0E+01		2/00											X		
ETHYLENE GLYCOL METHYL ETHER ACETATE - EGMEA	110-49-6	9.0E+01		2/00											X		
HEXACHLOROBENZENE	118-74-1	2.8E+00		7/90	X												
HEXACHLOROCYCLOHEXANES (mixed or technical grade)	608-73-1 1120	1.0E+00		1/91	X								X				
			3.0E-04	1/91	X								X				
alpha-HEXACHLOROCYCLOHEXANE	319-84-6	1.0E+00		1/91	X								X				
			3.0E-04	1/91	X								X				
beta-HEXACHLOROCYCLOHEXANE	319-85-7	1.0E+00		1/91	X								X				
			3.0E-04	1/91	X								X				

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OEHHA/ARB APPROVED CHRONIC REFERENCE EXPOSURE LEVELS AND TARGET ORGANS[◉]

Chemical	Chemical▼ Abstract Number	Chronic Inhalation REL ($\mu g/m^3$)	Chronic Oral REL	Date◆ Value Reviewed [Added]	Target Organs												
					Alimentary	Bone	Cardiovascular	Developmental	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Reproductive	Respiratory	Skin
gamma-HEXACHLOROCYCLOHEXANE (Lindane)	58-89-9	1.0E+00		1/91	X								X				
			3.0E-04	1/91	X								X				
HEXACHLOROCYCLOPENTADIENE	77-47-4	2.4E-01		1/91	X												
n-HEXANE	110-54-3	7.0E+03		4/00										X			
HYDRAZINE	302-01-2	2.0E-01		1/01	X				X								
HYDROCHLORIC ACID (Hydrogen chloride)	7647-01-0	9.0E+00		2/00												X	
HYDROGEN CYANIDE (Hydrocyanic acid) (see Cyanide Compounds)																	
HYDROGEN BROMIDE ... (see Bromine & Compounds)																	
HYDROGEN FLUORIDE (Hydrofluoric acid) (see Fluorides & Compounds)																	
HYDROGEN SULFIDE	7783-06-4	1.0E+01		4/00												X	
ISOPHORONE	78-59-1	2.0E+03		12/01	X			X									
ISOPROPYL ALCOHOL (Isopropanol)	67-63-0	7.0E+03		2/00				X					X				
LINDANE ... (see gamma-Hexachlorocyclohexane)																	
MALEIC ANHYDRIDE	108-31-6	7.0E-01		12/01												X	
MANGANESE AND COMPOUNDS	7439-96-5 [1132]	2.0E-01		4/00										X			
MERCURY AND COMPOUNDS (INORGANIC)	7439-97-6 [1133]	9.0E-02		2/00										X			
			3.0E-04	10/00 [1/92]								X	X				
Mercuric chloride	*7487-94-7*	*9.0E-02*		*2/00*										✓			
			3.0E-04	*10/00 [1/92]*								✓	✓				
MERCURY AND COMPOUNDS (ORGANIC)	N/A																
METHYL MERCURY	593-74-8	1.0E+00		1/91										X			
METHANOL	67-56-1	4.0E+03		4/00				X									
METHYL BROMIDE (Bromomethane)	74-83-9	5.0E+00		2/00				X						X		X	
METHYL tertiary-BUTYL ETHER	1634-04-4	8.0E+03		2/00	X					X			X				
METHYL CHLOROFORM (1,1,1-Trichloroethane)	71-55-6	1.0E+03		2/00										X			
METHYL ETHYL KETONE (2-Butanone)	78-93-3	1.0E+03[RfC]		1996											X		

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					Alimentary	Bone	Cardiovascular	Developmental	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Reproductive	Respiratory	Skin
METHYL ISOCYANATE	624-83-9	1.0E+00		12/01											X	X	
METHYL MERCURY ... (see Mercury & Compounds)																	
METHYL METHACRYLATE	80-62-6	9.8E+02		1/92												X	
METHYLENE CHLORIDE[TAC] (Dichloromethane)	75-09-2	4.0E+02		2/00			X							X			
4,4'-METHYLENE DIANILINE (AND ITS DICHLORIDE)	101-77-9	2.0E+01		12/01	X					X							
METHYLENE DIPHENYL ISOCYANATE	101-68-8	7.0E-01		1/01												X	
MINERAL FIBERS (<1% FREE SILICA)	N/A	2.4E+01		1/92												X	
Ceramic fibers (man-made)	*1056*	*2.4E+01*		*1/92*												✓	
Glasswool (man-made fibers)	*1111*	*2.4E+01*		*1/92*												✓	
Mineral fibers (fine: man-made)	*1136*	*2.4E+01*		*1/92*												✓	
Rockwool (man-made fibers)	*1168*	*2.4E+01*		*1/92*												✓	
Slagwool (man-made fibers)	*1181*	*2.4E+01*		*1/92*												✓	
NAPHTHALENE	91-20-3	9.0E+00		4/00												X	
NICKEL AND COMPOUNDS[TAC]	7440-02-0 [1145]	5.0E-02		2/00							X					X	
			5.0E-02	10/00	X												
Nickel acetate	*373-02-4*	*5.0E-02*		*2/00*							✓					✓	
			5.0E-02	*10/00*	✓												
Nickel carbonate	*3333-39-3*	*5.0E-02*		*2/00*							✓					✓	
			5.0E-02	*10/00*	✓												
Nickel carbonyl	*13463-39-3*	*5.0E-02*		*2/00*							✓					✓	
			5.0E-02	*10/00*	✓												
Nickel hydroxide	*12054-48-7*	*5.0E-02*		*2/00*							✓					✓	
			5.0E-02	*10/00*	✓												
Nickelocene	*1271-28-9*	*5.0E-02*		*2/00*							✓					✓	
			5.0E-02	*10/00*	✓												
NICKEL OXIDE	1313-99-1	1.0E-01		2/00							X					X	
			5.0E-02	10/00	X												

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					Alimentary	Bone	Cardiovascular	Developmental	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Reproductive	Respiratory	Skin
Nickel refinery dust from pyrometallurgical process	*1146*	*5.0E-02*		*2/00*							✓					✓	
			5.0E-02	*10/00*	✓												
Nickel subsulfide	*12035-72-2*	*5.0E-02*		*2/00*							✓					✓	
			5.0E-02	*10/00*	✓												
NITROBENZENE	98-95-3	1.7E+00		1/91	X								X				
NITROGEN DIOXIDE	10102-44-0	4.7E+02		1/92												X	
2-NITROPROPANE	79-46-9	2.0E+01		1/92	X												
OZONE	10028-15-6	1.8E+02		1/92												X	
PARTICULATE EMISSIONS FROM DIESEL-FUELED ENGINES[TAC]■	9901	5.0E+00[TAC]		8/98												X	
PENTACHLOROPHENOL ... (see Chlorophenols)																	
PERCHLOROETHYLENE[TAC] (Tetrachloroethylene)	127-18-4	3.5E+01[TAC]		10/91	X								X				
PHENOL	108-95-2	2.0E+02		4/00	X		X						X	X			
PHOSPHINE	7803-51-2	8.0E-01		9/02	X						X		X	X		X	
PHOSPHORIC ACID	7664-38-2	7.0E+00		2/00												X	
PHOSPHORUS (WHITE)	7723-14-0	7.0E-02		1/91				X*							X*		
PHTHALIC ANHYDRIDE	85-44-9	2.0E+01		1/01												X	
PCB (POLYCHLORINATED BIPHENYLS) [lowest, low and high risk]★	1336-36-3	1.2E+00		1/91	X			X*				X			X*		
			2.0E-05[RfD]	1996	X			X*				X			X*		
DIOXIN-LIKE POLYCHLORINATED BIPHENYLS (PCBS)[V]					X			X	X		X				X	X	
3,3',4,4'-TETRACHLOROBIPHENYL (PCB 77)	32598-13-3	4.0E-01		8/03	X			X	X		X				X	X	
			1.0E-04	8/03	X			X	X		X				X	X	
3,4,4',5-TETRACHLOROBIPHENYL (PCB 81)	70362-50-4	4.0E-01		8/03	X			X	X		X				X	X	
			1.0E-04	8/03	X			X	X		X				X	X	
2,3,3',4,4'-PENTACHLOROBIPHENYL (PCB 105)	32598-14-4	4.0E-01		8/03	X			X	X		X				X	X	
			1.0E-04	8/03	X			X	X		X				X	X	
2,3,4,4',5-PENTACHLOROBIPHENYL (PCB 114)	74472-37-0	8.0E-02		8/03	X			X	X		X				X	X	
			2.0E-05	8/03	X			X	X		X				X	X	

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					Alimentary	Bone	Cardiovascular	Developmental	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Reproductive	Respiratory	Skin
2,3',4,4',5-PENTACHLOROBIPHENYL (PCB 118)	31508-00-6	4.0E-01		8/03	X			X	X		X				X	X	
			1.0E-04	8/03	X			X	X		X				X	X	
2,3',4,4',5'-PENTACHLOROBIPHENYL (PCB 123)	65510-44-3	4.0E-01		8/03	X			X	X		X				X	X	
			1.0E-04	8/03	X			X	X		X				X	X	
3,3',4,4',5-PENTACHLOROBIPHENYL (PCB 126)	57465-28-8	4.0E-04		8/03	X			X	X		X				X	X	
			1.0E-07	8/03	X			X	X		X				X	X	
2,3,3',4,4',5-HEXACHLOROBIPHENYL (PCB 156)	38380-08-4	8.0E-02		8/03	X			X	X		X				X	X	
			2.0E-05	8/03	X			X	X		X				X	X	
2,3,3',4,4',5'-HEXACHLOROBIPHENYL (PCB 157)	69782-90-7	8.0E-02		8/03	X			X	X		X				X	X	
			2.0E-05	8/03	X			X	X		X				X	X	
2,3',4,4',5,5'-HEXACHLOROBIPHENYL (PCB 167)	52663-72-6	4.0E+00		8/03	X			X	X		X				X	X	
			1.0E-03	8/03	X			X	X		X				X	X	
3,3',4,4',5,5'-HEXACHLOROBIPHENYL (PCB 169)	32774-16-6	4.0E-03		8/03	X			X	X		X				X	X	
			1.0E-06	8/03	X			X	X		X				X	X	
2,3,3',4,4',5,5'-HEPTACHLOROBIPHENYL (PCB 189)	39635-31-9	4.0E-01		8/03	X			X	X		X				X	X	
			1.0E-04	8/03	X			X	X		X				X	X	
POLYCHLORINATED DIBENZO-P-DIOXINS (PCDD) (AS 2,3,7,8-EQUIV)[TAC●]	1085 1086	4.0E-05		2/00	X			X	X		X				X	X	
			1.0E-08	10/00	X			X	X		X				X	X	
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN[TAC]	1746-01-6	4.0E-05		2/00	X			X	X		X				X	X	
			1.0E-08	10/00	X			X	X		X				X	X	
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	40321-76-4	4.0E-05		8/03	X			X	X		X				X	X	
			1.0E-08	8/03	X			X	X		X				X	X	
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	39227-28-6	4.0E-04		2/00	X			X	X		X				X	X	
			1.0E-07	10/00	X			X	X		X				X	X	
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	57653-85-7	4.0E-04		2/00	X			X	X		X				X	X	
			1.0E-07	10/00	X			X	X		X				X	X	
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	19408-74-3	4.0E-04		2/00	X			X	X		X				X	X	
			1.0E-07	10/00	X			X	X		X				X	X	

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1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	35822-46-9	4.0E-03		2/00	X			X	X		X				X	X	
			1.0E-06	10/00	X			X	X		X				X	X	
1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-P-DIOXIN	3268-87-9	4.0E-01		8/03	X			X	X		X				X	X	
			1.0E-04	8/03	X			X	X		X				X	X	
POLYCHLORINATED DIBENZOFURANS (PCDF) (AS 2,3,7,8-EQUIV) [TAC●]	1080	4.0E-05		2/00	X			X	X		X				X	X	
			1.0E-08	10/00	X			X	X		X				X	X	
2,3,7,8-TETRACHLORODIBENZOFURAN	5120-73-19	4.0E-04		2/00	X			X	X		X				X	X	
			1.0E-07	10/00	X			X	X		X				X	X	
1,2,3,7,8-PENTACHLORODIBENZOFURAN	57117-41-6	8.0E-04		2/00	X			X	X		X				X	X	
			2.0E-07	10/00	X			X	X		X				X	X	
2,3,4,7,8-PENTACHLORODIBENZOFURN	57117-31-4	8.0E-05		2/00	X			X	X		X				X	X	
			2.0E-08	10/00	X			X	X		X				X	X	
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	70648-26-9	4.0E-04		2/00	X			X	X		X				X	X	
			1.0E-07	10/00	X			X	X		X				X	X	
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	57117-44-9	4.0E-04		2/00	X			X	X		X				X	X	
			1.0E-07	10/00	X			X	X		X				X	X	
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	72918-21-9	4.0E-04		2/00	X			X	X		X				X	X	
			1.0E-07	10/00	X			X	X		X				X	X	
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	60851-34-5	4.0E-04		2/00	X			X	X		X				X	X	
			1.0E-07	10/00	X			X	X		X				X	X	
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	67562-39-4	4.0E-03		2/00	X			X	X		X				X	X	
			1.0E-06	10/00	X			X	X		X				X	X	
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	55673-89-7	4.0E-03		2/00	X			X	X		X				X	X	
			1.0E-06	10/00	X			X	X		X				X	X	
1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN	39001-02-0	4.0E-01		8/03	X			X	X		X				X	X	
			1.0E-04	8/03	X			X	X		X				X	X	
POTASSIUM BROMATE ... (see Bromine & Compounds)																	
PROPYLENE (PROPENE)	115-07-1	3.0E+03		4/00												X	

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					Alimentary	Bone	Cardiovascular	Developmental	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Reproductive	Respiratory	Skin
PROPYLENE GLYCOL MONOMETHYL ETHER	107-98-2	7.0E+03		2/00	X												
PROPYLENE OXIDE	75-56-9	3.0E+01		2/00												X	
SELENIUM AND COMPOUNDS (other than hydrogen selenide)	7782-49-2 [1170]	2.0E+01		12/01	X		X							X			
Selenium sulfide	*7446-34-6*	*2.0E+01*		*12/01*	✓		✓							✓			
SODIUM HYDROXIDE	1310-73-2	4.8E+00		7/90						X*						X	X*
STYRENE	100-42-5	9.0E+02		4/00										X			
SULFATES	9960	2.5E+01		1/92												X	
SULFUR DIOXIDE	7446-09-5	6.6E+02		1/92												X	
SULFURIC ACID	7664-93-9	1.0E+00		12/01												X	
Sulfuric Acid and Oleum	*7664-93-9*	*1.0E+00*		*12/01*												✓	
Sulfuric Trioxide	*7446-71-9*	*1.0E+00*		*12/01*												✓	
Oleum	*8014-95-7*	*1.0E+00*		*12/01*												✓	
TETRACHLOROPHENOLS ... (see Chlorophenols)																	
TOLUENE	108-88-3	3.0E+02		4/00				X						X		X	
Toluene diisocyanates	*26471-62-5 1204*	*7.0E-02*		*1/01*												✓	
TOLUENE-2,4-DIISOCYANATE	584-84-9	7.0E-02		1/01												X	
TOLUENE-2,6-DIISOCYANATE	91-08-7	7.0E-02		1/01												X	
TRICHLOROETHYLENE[TAC]	79-01-6	6.0E+02		4/00						X				X			
TRIETHYLAMINE	121-44-8	2.0E+02		9/02						X							
VINYL ACETATE	108-05-4	2.0E+02		12/01												X	
VINYL BROMIDE	593-60-2	7.0E+00[RfC]		1996	X												
VINYL CHLORIDE[TAC] (Chloroethylene)	75-01-4	2.6E+01		7/90	X			X*							X*		
VINYLIDENE CHLORIDE (1,1,-Dichloroethylene)	75-35-4	7.0E+01		1/01	X												
XYLENES (mixed isomers)	1330-20-7 1210	7.0E+02		4/00										X		X	
m-XYLENE	108-38-3	7.0E+02		4/00										X		X	
o-XYLENE	95-47-6	7.0E+02		4/00										X		X	
p-XYLENE	106-42-3	7.0E+02		4/00										X		X	

Table 3
OEHHA/ARB APPROVED CHRONIC REFERENCE EXPOSURE LEVELS AND TARGET ORGANS[◉]

Chemical	Chemical▼ Abstract Number	Chronic Inhalation REL ($\mu g/m^3$)	Chronic Oral REL	Date◆ Value Reviewed [Added]	Target Organs												
					Alimentary	Bone	Cardiovascular	Developmental	Endocrine	Eye	Hematologic	Immune	Kidney	Nervous	Reproductive	Respiratory	Skin
ZINC COMPOUNDS	7440-66-6 [1211]	3.5E+01		7/90			X*				X*					X	
Zinc oxide	*1314-13-2*	*3.5E+01*		*7/90*			✓*				✓*					✓	

Table 3
OEHHA/ARB APPROVED CHRONIC REFERENCE EXPOSURE LEVELS AND TARGET ORGANS

Purpose:	The purpose of this reference table is to provide a quick list of all health values that have been approved by the Office of Environmental Health Hazard Assessment (OEHHA) and the Air Resources Board (ARB) for use in facility health risk assessments conducted for the AB 2588 Air Toxics Hot Spots Program. The OEHHA has developed and adopted new risk assessment guidelines that update and replace the California Air Pollution Control Officers Association's (CAPCOA) *Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines, October 1993*. The OEHHA has adopted five technical support documents for these guidelines. This table lists the OEHHA adopted inhalation and oral noncancer chronic RELs. In addition, it lists the substances in Appendix A-I *(Substances For Which Emissions Must Be Quantified)* and Appendix F (*Criteria For Inputs For Risk Assessment Using Screening Air Dispersion Modeling*) of the ARB's *Air Toxics "Hot Spots" Emission Inventory Criteria and Guidelines (EICG) (July 1997)*. OEHHA is still in the process of adopting new noncancer chronic RELs. Therefore, new health values will periodically be added to, or deleted from, this table. Users of this table are advised to monitor the OEHHA website (*www.oehha.ca.gov*) for any updates to the health values.
❁	Substances written in *italics* and with a ✓ do not have explicit OEHHA approved health values, but are included in this table to clarify applicability of OEHHA adopted heath effects values to individual or grouped substances listed in the *Air Toxics "Hot Spots" Emission Inventory Criteria and Guidelines*, Appendix A-I list of *"Substances For Which Emissions Must Be Quantified".*
▼	Chemical Abstract Service Number (CAS): For chemical groupings and mixtures where a CAS number is not applicable, the 4-digit code used in the *Air Toxics "Hot Spots" Emission Inventory Criteria and Guidelines (EICG) Report* is listed. The 4-digit codes enclosed in brackets [ ] are codes that have been phased out, but may still appear on previously reported Hot Spots emissions. For information on the origin and use of the 4-digit code, see the EICG report.
✕ *	These are chronic RELs which were approved by CAPCOA for use in the AB 2588 Air Toxics Hot Spots Program. These CAPCOA chronic RELs will eventually be removed or replaced by approved OEHHA chronic RELs. In the CAPCOA Guidelines (1993), these target organ systems were combined (reproductive/developmental; cardiovascular/blood).
◆	Date Value Reviewed [Added]: This column lists the date that the health value was last reviewed by OEHHA and the Scientific Review Panel, and/or approved for use in the AB 2588 Air Toxics Hot Spots Program. If the health value is unchanged since it was first approved for use in the "Hot Spots" Program, then the date that the value was first approved for use by CAPCOA is listed within the brackets [ ]. • February 2000, April 2000, January 2001, and December 2001 are listed for the first set of 22, the second set of 16, the third set of 22, and the fourth set of 12 noncancer chronic RELs, respectively. The chronic REL for carbon disulfide was adopted in May 2002. Chronic RELs for phosphine and triethylamine were adopted in September 2002. Chronic RELs for fluorides including hydrogen fluoride were adopted August 2003. • October 2000 is listed for the oral chronic RELs. 1996 is listed for the U.S. EPA Reference Concentrations. Dates of 1990-1992 are listed for chronic RELs that may eventually be dropped or replaced. • For the substances identified as Toxic Air Contaminants, the Air Resources Board hearing date is listed. The date for acetaldehyde represents the date the value was approved by the Scientific Review Panel.
RfC/RfD	United States Environmental Protection Agency (U.S. EPA) Reference Concentrations (RfCs) and oral Reference Doses (RfDs) from the U.S. EPA Integrated Risk Information System (1996) have been added if the U.S. EPA health value and/or endpoint was different from the 1993 CAPCOA value or endpoint and OEHHA has not adopted a new value as part of the Hot Spot Risk Assessment Guidelines. The RfCs and RfDs listed meet the criteria of Appendix F of the Air Resources Board's Emission Inventory Criteria and Guidelines Report effective July 1, 1997. These RfC/RfDs may be replaced by new OEHHA values in the future.
TAC	Toxic Air Contaminant: The Air Resources Board has identified this substance as a Toxic Air Contaminant.
★	Polychlorinated Biphenyls (unspeciated mixtures): Chronic Oral: The chronic oral value is U.S. EPA's 1996 oral Reference Dose for Aroclor-1254.
V	Polychlorinated Biphenyls (speciated): Values calculated using WHO_{97} TEF procedure. See OEHHA memo dated August 29, 2003.
•	Polychlorinated Dibenzo-*p*-dioxins and Polychlorinated Dibenzofurans (also referred to as chlorinated dioxins and dibenzofurans): The OEHHA has adopted the World Health Organization 1997 (WHO_{97}) Toxicity Equivalency Factor scheme for evaluating the cancer risk due to exposure to samples containing mixtures of polychlorinated dibenzo-*p*-dioxins (PCDD) and polychlorinated dibenzofurans (PCDF) and determining cancer risks for a number of specific PCB congeners. See Appendix A of OEHHA's *Technical Support Document For Describing Available Cancer Potency Factors* for more information about the scheme. See Appendix E of OEHHA's *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* for the methodology for calculating 2,3,7,8-equivalents for PCDD, PCDFs and a number of specific PCB congeners.
■	Particulate Emissions from Diesel-Fueled Engines: The inhalation cancer potency factor and chronic REL were derived from whole diesel exhaust and should be used only for impacts from the inhalation pathway. The inhalation impacts from speciated emissions from diesel-fueled engines are already accounted for in the inhalation cancer potency factor and REL. However, at the discretion of the risk assessor, speciated emissions from diesel-fueled engines may be used to estimate acute noncancer health impacts or the contribution to cancer risk or chronic noncancer health impacts for the non-inhalation exposure pathway. See Appendix D of OEHHA's document *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* for more information.

Table last updated: December 4, 2003

Appendix J

Asbestos Quantity Conversion Factors

Appendix J

Asbestos Quantity Conversion Factors

A. "PCM" versus "TEM"

Two main analytical methods have been used for the analysis of asbestos samples: phase contrast microscopy (PCM), the primary method used historically to analyze asbestos samples, and transmission electron microscopy (TEM), the current state-of-the-art method.

PCM analysis has been preferred in the past over TEM because it can be done more quickly and it is less expensive. One major limitation of PCM analysis, however, especially in outdoor environments, is that the analyst cannot distinguish asbestos from non-asbestos fibers, such as cellulose, talc, or gypsum. Also, PCM cannot detect fibers that have a diameter of about 0.3 microns or less, which could substantially underestimate the asbestos fiber concentrations. These limitations make PCM impractical for the analysis of ambient asbestos samples.

Transmission electron microscopy (TEM) is the preferred analytical method for outdoor asbestos samples because of its ability to detect small fibers (greater than or equal to 0.0002 microns in diameter) and to distinguish between asbestos fibers and non-asbestos fibers. The term "TEM structures" is often used to describe asbestos fibers detected by this method. TEM is the method recommended by the Office of Environmental Health Hazard Assessment (OEHHA). TEM measurements cannot be directly related to the risk potency factors, however, because the studies upon which OEHHA's risk assessment was based used the less expensive PCM analysis. The TEM measurements must be converted to PCM-equivalent units, using the following equation (ARB, 1990):

$$1\,\text{PCM fiber} = 320\,\text{TEM structures}$$

B. Asbestos Inhalation Cancer Potency Factor

The unit risk factor for asbestos fibers is 1.9×10^{-4} in units of $(100\ \text{PCM fibers/m}^3)^{-1}$ and the unit risk factor is 6.3×10^{-2} in units of $(\mu\text{g/m}^3)^{-1}$. The unit risk factor is based on epidemiological studies in which PCM fiber measurements were used. These unit risk factors are listed in Chapter 7 and in the Asbestos Toxic Air Contaminant (TAC) identification document (CDHS, 1986) and in OEHHA, 1999b. These asbestos cancer potency factors are for mesothelioma. Since these cancer potency factors are in units of concentration or dose, complications arise when the emitted asbestos quantities are reported in mass units (pounds/year and maximum pounds/hour) for the Air Toxics Hot Spots Program (Hot Spots).

The TAC inhalation cancer potency factor has been converted from mass to concentration using a factor of 0.003 µg asbestos = 100 asbestos PCM fibers. This conversion has been derived from information published by the United States Environmental Protection Agency (U.S. EPA) (U.S. EPA, 1986). The number of asbestos PCM fibers associated with a given mass of asbestos can vary appreciably. Also, U.S. EPA has stated that this conversion factor is the geometric mean of measured relationships between optical fiber counts and mass airborne chrysotile in several published studies, that the range of the conversion factor between the different studies is large (0.0005 - 0.015 µg asbestos/100 asbestos PCM fibers), and that the factor carries with it an appreciable uncertainty.

The current recommendation for Hot Spots risk assessments uses a default breathing rate of 393 L/day-kg body weight for a 70 year exposure duration. A dose is calculated from the ground level concentration using the following equation:

$$X\ (\mu g/m^3) \times 393\ L/day\text{-}kg\ body\ weight \times 10^{-6} = dose\ (mg/kg\text{-}day)$$

The 10^{-6} term converts the L in the breathing rate to m^3 and the µg in the air concentration term to mg.

In order to obtain cancer risk the dose is subsequently multiplied times the cancer potency factor as follows:

Dose (mg/kg-body weight) x cancer potency factor (mg/kg-body weight) = Cancer risk (unitless)

For risk communication purposes cancer risk may be converted into chances per million of developing cancer. This terminology is often more clearly understood by the public than cancer risk.

Cancer risk x (1×10^6) = chances per million of developing cancer

The cancer potency factor $(mg/kg\ body\ weight)^{-1}$ may be calculated from the fiber cancer potency factor using the relationship of 0.003 µg = 100 fibers PCM, 70 kg body weight, 20 m^3 breathed per day, and a factor of 1000 to convert µg asbestos into mg:

$$1.9\times10^{-4}\left(100\ PCM\ \ fibers/m^3\right)^{-1}\times\frac{70kg}{20m^3}\times\frac{1000}{0.003mg/100\ fibers}=2.2\times10^{+2}\left(mg/kg\ body\ weight\right)^{-1}$$

The ISCST3 air dispersion modeling program estimates concentrations in units of $\mu g/m^3$ based on emission estimates in lb/yr. If the ground level concentrations are derived from PCM fiber measurements, then no additional uncertainty is introduced by the conversion to µg using the factor of 0.003. This is because the factor is effectively cancelled out by its use to derive the cancer potency factor in $(mg/kg\ body\ weight)^{-1}$. There is a slight rounding error that may be introduced.

References

ARB, 1990. Proposed Control Measure for Asbestos-Containing Serpentine Rock in Surfacing Applications, Technical Support Document, Air Resources Board, February 1990.

CDHS, (1986) California Department of Health Services (CDHS) 1986. Report to the Air Resources Board on Asbestos. Part B. Health Effects of Asbestos. Epidemiological Studies Section, Berkeley, CA.

OEHHA. (1999b). Air Toxics Hot Spots Program Risk Assessment Guidelines. Part II. Technical Support Document for Describing Available Cancer Potency Factors. Available online at http://www.oehha.ca.gov

USEPA, 1986. Airborne Asbestos Health Assessment Update. EPA/600/8-84/003F, Office of Health and Environmental Assessment, Washington, DC.

Appendix K

Risk Assessment Procedures to Evaluate Particulate Emissions from Diesel-Fueled Engines

Appendix K

Risk Assessment Procedures to Evaluate Particulate Emissions from Diesel-Fueled Engines

A. Introduction

The objective of this appendix is to discuss procedures for estimating potential cancer and noncancer health risk from exposure to particulate matter (PM) emissions from diesel-fueled engines (diesel exhaust). It will also clarify the requirements and recommendations for acute noncancer and multipathway cancer and chronic risk assessment for diesel PM. In addition to the notification and risk reduction requirements under the Hot Spots Program, this appendix should facilitate the use of the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles* (ARB, 2000) (Diesel Guidelines). The Diesel Guidelines were developed by the Air Resources Board (ARB) with assistance from the Office of Environmental Health Hazard Assessment (OEHHA) in October 2000. The Diesel Guidelines are intended to assist local Air Pollution Control and Air Quality Management Districts (Districts) and sources of diesel PM emissions in making consistent risk management decisions.

In advance of performing a health risk assessment (HRA), it is recommended that the District and the stationary source of diesel emissions reach a consensus on the HRA approach for estimating health impacts from diesel exhaust. See Chapter 9 for an outline of a modeling protocol.

B. Calculations/Risk Assessment Procedures

In August 1998, the ARB identified diesel exhaust as a toxic air contaminant (TAC) (ARB, 1998). In the identification report, OEHHA provided an inhalation noncancer chronic reference exposure level (REL) of 5 micrograms per cubic meter ($\mu g/m^3$) and a range of inhalation cancer potency factors of 1.3×10^{-4} to 2.4×10^{-3} $(\mu g/m^3)^{-1}$. The Scientific Review Panel on Toxic Air Contaminants recommended a "reasonable estimate" inhalation unit risk factor of 3.0×10^{-4} $(\mu g/m^3)^{-1}$. From the unit risk factor an inhalation cancer potency factor of 1.1 $(mg/kg\text{-}day)^{-1}$ may be calculated. These noncancer and cancer health factors were developed based on whole (gas and particulate matter) diesel exhaust. The surrogate for whole diesel exhaust is diesel PM. PM_{10} (particulate matter, ten microns or less in size) is the basis for the potential risk calculations.

Cancer

When conducting an HRA, the potential cancer risk from inhalation exposure to diesel PM will outweigh the potential noncancer health impacts. Therefore, inhalation cancer risk is required for every HRA. (The methods for calculating inhalation cancer risk can be found in Chapters 5, 7, and 8.) When comparing whole diesel exhaust to speciated diesel exhaust (e.g., PAHs, metals), potential cancer risk from inhalation exposure to whole diesel exhaust will

outweigh the multipathway cancer risk from the speciated components. For this reason, there will be few situations where an analysis of multipathway risk is necessary.

The District may elect to require a multipathway analysis if reliable data are available and the District decides that it is necessary. If the District elects to require a multipathway analysis, the components of the diesel exhaust will need to be speciated since there is not an oral cancer potency factor for diesel PM. It is recommended that the District be consulted on the procedures for conducting a multipathway analysis for diesel exhaust. The District may wish to use speciation data from the ARB. If so, a resource for speciation data is available on the ARB's website at www.arb.ca.gov/emisinv/speciate/speciate.htm.

If a multipathway analysis is required, the speciated data should be compared with the substances in Table 5.1. Any substances in the speciation profile that are listed in Table 5.1 and have an oral cancer potency factor in Table 7.1 should be included in the multipathway analysis. Potential multipathway cancer risks are estimated following the procedures in Chapters 5 and 8 of this document. These procedures require summing the potential cancer risk from each carcinogen to estimate the total facility cancer risk.

Noncancer Chronic

To determine noncancer chronic inhalation health impacts from exposure to diesel exhaust use the methods described in Chapters 6 and 8.

In most situations, noncancer health impacts from inhalation exposure to whole diesel exhaust will outweigh the noncancer multipathway health impacts to the speciated components of diesel exhaust. However, there may be situations when the multipathway impacts need to be investigated.

Therefore, the District may elect to require a multipathway analysis if reliable data is available and they feel it is necessary. If the District elects to require a multipathway analysis, the components of the diesel exhaust will need to be speciated since there is not an oral reference exposure level for diesel PM. A resource for speciation data at the ARB is identified above. It is recommended that the District be consulted on the procedures for conducting a multipathway analysis. If a multipathway analysis is required, the speciated data should be compared with the substances in Table 5.1. Any substances in the speciation profile that are listed in Table 5.1 and have an oral chronic REL in Table 6.3 should be included in the multipathway analysis. Potential multipathway chronic risks are estimated following the procedures in Chapters 5 and 8 of this document.

Noncancer Acute

As stated above, potential cancer risk is usually the driving health impact for diesel exhaust. However, there may be certain unusual situations where an evaluation of the acute health effects may be warranted. One possible situation is when a nearby receptor is located above the emission release point (e.g. on a hillside or in a multistory apartment building). Since there is no acute REL for diesel exhaust, the components of the exhaust will need to be speciated to determine the potential acute health impacts. It is recommended that the District be consulted on the procedures for conducting an acute analysis. If an acute analysis is required, the speciated

data should be compared with the substances in Table 6.1. Any substances in the speciation profile that are listed in Table 6.1 should be included in the acute analysis. A resource for speciation data at the ARB is identified above. Potential acute risks are estimated following the procedures in Chapters 6 and 8 of this document.

References:

ARB 1998. Air Resources Board, "Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant, Appendix III, Part A, Exposure Assessment," April 1998.

ARB 2000. Air Resources Board, "Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles," October 2000.

Appendix L

Overview of the Lead Risk Assessment Procedures

Appendix L

Overview of the Lead Risk Assessment Procedures

I. Introduction

The objective of this appendix is to provide a method for estimating potential cancer and noncancer health effects due to airborne lead exposure. This appendix should facilitate the use of the *Risk Management Guidelines for New, Modified, and Existing Sources of Lead* (Lead RM Guidelines) (ARB, 2001) for analysis of lead exposure. The Lead RM Guidelines were developed by the Air Resources Board (ARB) with assistance from Office of Environmental Health Hazard Assessment (OEHHA) and Department of Health Services (DHS) in March 2001 to assist local air districts and sources of lead in making consistent risk management decisions for new, modified, and existing sources of lead.

In April 1997, the ARB identified inorganic lead as a toxic air contaminant (TAC) (ARB, 1997). Lead is unique among other TACs identified by ARB in several ways. First, infants and children are particularly susceptible to the health effects of lead, and the risk assessment is based on health effects in children. Second, the chronic noncancer effects are related to blood lead levels (BLLs) as opposed to ambient air concentrations. These BLLs reflect current and past exposure from a number of sources; air emissions may only be a small part of the total exposure. Third, based on recommendations of the OEHHA and the Scientific Review Panel on Toxic Air Contaminants (SRP), the ARB did not identify a threshold level for chronic noncancer health effects due to lead exposure. Threshold levels are levels below which no adverse health effects are expected to occur. Since acute or chronic Reference Exposure Levels (RELs) are based on threshold levels, none were developed for lead. Thus, a hazard index approach is not used for lead. Instead, air concentrations are compared to defined air lead levels associated with specified percentages of children with BLL $\geq$ 10 µg/dL. Acceptable risk is based on minimizing the number of children at or above a BLL of 10 µg/dL.

II. Methods for Estimation of Health Risk Effects

Methods for estimating site-specific noncancer and cancer potential health impacts from exposure to lead emissions are given in the Lead RM Guidelines. The noncancer health effects pose greater public health significance than the cancer health effects. Minimizing noncancer health effects of lead will therefore also minimize cancer health effects.

Chronic noncancer health risks are estimated based on neurodevelopmental health risks to children and would also be protective of adults. These health effects can be evaluated using a tiered approach based on blood lead level distribution in the population.

Potential multipathway cancer risks are estimated following the procedures in Chapters 5 and 8 of this document. These procedures require summing individual cancer risk from each carcinogen to estimate the total facility cancer risk.

In advance of performing a health risk assessment (HRA), it is recommended that the Air Pollution Control or Air Quality Management District (District) and the stationary source of lead air emissions reach a consensus on the HRA approach for estimating chronic noncancer and cancer health risks. See Chapter 9 for an outline of a modeling protocol.

A. Tiered Approach for Estimating Noncancer Risks due to Lead Exposure

The Lead Risk Management Guidelines provide three tiers of analysis to determine baseline BLL distributions for estimating risk. Although there is a simple risk management option provided in the Lead RM Guidelines, in a risk assessment for the Air Toxics Hot Spots program one of the following tiers must be used to report estimates of the percent of children estimated to be above 10 µg/dL blood lead. The tiered approach is based on an assessment of neurodevelopmental risk, with the BLL distribution in the population as the most significant factor. The BLL distribution consists of two components: 1) the baseline BLL distribution due to all sources of exposure; and 2) the exposure due to emissions from a facility.

Tier I is a default approach that requires minimal site-specific information on concentrations of lead in environmental media other than air. Tier I uses two default BLL distributions, one for a high exposure scenario and one for an average exposure scenario. The exposure scenario is determined using the median age of the homes in the census tract and the ratio of area income to the poverty level. The default baseline BLL distribution for each of the exposure scenarios is based on a review of neighborhood and community blood lead studies. The assessor determines the 30-day average lead concentration due to the facility averaged over the 1 square kilometer area centered on the Maximum Offsite Concentration (MOC). The percentage of children with BLLs greater than or equal to 10 micrograms per deciliter (≥ 10 µg/dL) is determined using Table L-1 (also found on page 17 in the Lead RM Guidelines), the air lead concentration, and the determined exposure scenario. The 10 µg/dL threshold level has been identified by the Centers for Disease Control and Prevention (CDC) as a level where potential health effects may occur. The public health goal of management practices should be to implement procedures/practices to prevent BLLs at or above this level. The estimated percentage of children with BLLs ≥ 10 µg/dL is then used with risk management levels given in Chapter III, Section D of the Lead RM Guidelines to assist in making risk management decisions.

Table L-1 Percentage of Children with Blood Lead Levels ³ 10 µg/dl for Various Air Lead Concentrations at Two Exposure Scenarios

Air Lead Concentration in the Maximum Exposure Area (30-day average) [µg/m³]	Percent ³ 10 µg/dL	
	High Exposure Scenario	Average Exposure Scenario
Baseline*	5.1	1.2
0.02	5.4	1.4
0.06	6.1	1.7
0.10	6.8	2.2
0.20	8.9	3.4
0.25	9.8	4.1
0.50	15.9	8.9
0.75	22.4	15.4
1.0	29.1	23.0
1.5	42.5	39.0

* The baseline represents BLLs due to lead in soil, dust, water, food, and background air lead concentrations.

Tier II requires the development of site-specific baseline BLL distributions within the impacted population using site-specific estimates of lead levels in environmental media, including soil, dust, water, and/or food, using the U.S. EPA Integrated Exposure Uptake Biokinetic (IEUBK) model. The IEUBK model calculates the probability of an individual exceeding a specific BLL based on site-specific information. The aggregate of the individual BLLs is used to estimate the neurodevelopmental risk in the maximum exposure area. A detailed discussion of this tier is beyond the scope of this overview; see Appendix D in the Lead RM Guidelines for a discussion of the IEUBK model and its use.

Tier III involves actual blood lead sampling of the population impacted by the facility to define the baseline BLLs. In Tier III, the facility is responsible for conducting BLL testing to establish a site-specific BLL distribution. The Lead RM Guidelines recommend the neurodevelopmental risk be calculated as the probability of children in an affected exposure area having a BLL ≥ 10 µg/dL using the results of the blood lead sampling. It is highly unlikely that this option would be used due to the cost incurred and the fact that the sampled population must consent to the sampling and an appropriate sampling strategy must be developed to adequately characterize the blood lead levels of the impacted population.

For further information on the tiered approach using the Tier I, Tier II, or Tier III, please see Chapter II of the *ARB Risk Management Guidelines for New, Modified, and Existing Sources of Lead* (ARB, 2001). This document can be downloaded from the ARB web site at *http://www.arb.ca.gov/toxics/lead/lead.htm* or can be requested by calling (916) 323-4327.

B. Methods for Estimating Potential Cancer Risks due to Lead

While lead has a unique noncancer assessment methodology, the determination of potential multipathway cancer risk is the same as other carcinogens. Chapters 5, 7, and 8, and Appendices I and L provide all the needed information for calculating potential cancer risk. The health risk assessment should report the multipathway cancer risks from lead emissions.

Chapter III in the Lead RM Guidelines provides methods for determining risk management of lead exposure, using the results from the cancer risk calculation, and the local District's defined significance levels.

III. References

ARB, 1997. Proposed Identification Inorganic Lead as a Toxic Air Contaminant, Parts A, B, C. California Air Resources Board. April, 1997.

ARB, 2001. ARB Risk Management Guidelines for New, Modified, and Existing Sources of Lead. California Air Resources Board. March 2001

Appendix M

Basic Instructions for Exporting HARP Risk Results And Importing Them Into GIS

Using ArcView-ArcMap and Spatial Analyst

Appendix M
Basic Instructions for Exporting HARP Risk Results and Importing them into GIS
-- Using ArcView-ArcMap and Spatial Analyst --

Prerequisites: Must own ArcGIS 8.x software (ArcMap) for Steps A-C, and Spatial Analyst Extension for Step D. Microsoft Access database software is strongly recommended also.

A. Exporting Risk Data By Receptor From HARP.

1. **Run HARP Risk with UTMs**: Run the desired risk analysis from the HARP risk window, for example 70-year adult resident, cancer, derived. Be sure to check the box for **"Include UTMs".** Also check the box for **"Include UTM zone**".

   NOTE: If your analysis was in a region that crosses 2 UTM zones (zone 10 and 11), you must check the box for "Include UTM zone" and after running the export, you will also have to separate the two UTM zones' data into 2 separate files.

2. **EXPORT ALL DETAILS**: When you have run your desired risk analysis report in HARP, choose the HARP pulldown (from the Risk window) for Export | Export All Details. Accept the default location (C:\HARP\Projects\….) or browse to another folder -- remember what you have chosen.

3. **File Explorer**: Using Windows File Explorer, navigate to the folder where you just exported the HARP files.

   NOTE: Be sure you see a Rep_xxx.txt file that corresponds to the most recent risk analysis run you just did and want to export. For example, the 70-year resident, Derived(OEHHA) risk, for all receptors, with UTMs included, is called by default: Rep_Can_70yr_DerAdj_AllRec_AllSrc_AllCh_ByRec_Site_UTM.txt. If this is the risk analysis you want to export to GIS, this report should be the most recently run "Rep_xxx.txt" report in your folder.

4. **RISK.CSV File:** In your folder, find the file called RISK.CSV. Double-click the file to open it in Excel.

You should see columns for the receptor ID, receptor type (e.g. Grid), Cancer Risk (if you calculated it), Chronic Hazard Index (if calculated), Acute Hazard Index by screening method (if calculated), Acute Hazard Index by full maximum hourly method (if you calculated it), UTM East coordinate (in meters), UTM Northing coordinate (meters), and UTM zone (if chosen).
Verify that this RISK.CSV file has the desired risk or HI values that you want to import into GIS.

** NOTE: A value of -1.00 E+00 in the risk or HI columns means you did not run the analysis to compute that type of risk or HI.

5. **Format Cleanup**: You need to do a bit of tidying-up for this file's headers to work well in the next step. You may wish to make a copy of the file with a slightly different name so you have a backup.
   a. Delete the first row which contains the header line: File: C:\HARP.....
   b. Merge the column headers into a single line (row): combine the 2-line headers, e.g., Cancer (above), and Risk (below) onto a single line and delete the extra line.

Save your changes to Microsoft Excel format (.XLS). (Be sure your cursor is positioned in one of the cells, and no rows or columns are highlighted when you do the Save).

B. Converting Comma-Delimited or Excel Risk File into a Table Format Accepted by GIS.

DECISION: You have 2 choices for saving the risk file to a GIS-ready format**. If you have Microsoft Access, it is generally simplest to use Option 1.** If you do not have Microsoft Access, use Option 2.

OPTION 1: Save to a Microsoft Access table for ArcView to use.
[If you have Microsoft Access, this is the simplest option.]

1. Close Excel if you have the RISK.CSV or RISK.XLS file still open.
2. Start Microsoft Access and create a new, blank database. Give it a name and location of your choosing.
3. Choose File | Get External Data | Import. Browse to the folder where your RISK.XLS file is. Change the "Files of type" pulldown to Microsoft Excel Files (.xls). You should see your RISK.XLS file. Choose it and click Import.
4. Check the box for "First Row Contains Column Headings. (Your data should look parsed correctly into columns.) Click Next.
5. Choose In a New Table, then Next.
6. Choose that the Receptor field will be Indexed, as "Yes (No Duplicates)". Click Next.
7. Choose the radio button "Choose my own primary key". Receptor should pop into the window. (If it doesn't, choose it from the pulldown.) Click Next. [You could let Access create a primary key if you'd prefer.]
8. Accept the default table name (or choose your own). Click Finish.
9. Once Access has finished importing the data, you can double click the table name and verify that it contains your data, parsed into the correct fields.
10. Close Access. (You must **not** have Access open to this table when you try to open it from ArcView.)

OPTION 2: Save to a dBase IV (.dbf) table for ArcView to use. AVOID IF POSSIBLE. [If you do not have Microsoft Access, you may have to use this option, but it can be tricky. Follow all steps.]

1. Have the RISK.XLS file open from completing step A5.
2. Saving from Excel to .dbf format is quirky, so you need to set all format and width formatting options explicitly in Excel before saving to the .dbf format, as follows.
3. Within Excel, hold down the Cntl key and select the column headers for Receptor ID, UTME, UTMN, and UTMzone (if included). Right click, and choose Format Cells. Choose Number. Set the number of Decimal Places to 0 (zero). Click OK.
4. With these columns still selected, Right click again. Choose Column Width. Enter a width that is at least 20% more than what Excel implies. I suggest 20 for these columns
5. Now click a cell to de-select everything.
6. Holding down the Cntl key, select the column headers for Cancer, Chronic, and both Acute columns. Right click, choose Format Cells. Choose Number, 11 decimal places. Click OK.
7. Right click the selected columns again. Choose Column width. Enter 25.
8. Now click to position your cursor in cell A1. Nothing should be highlighted/selected.
9. Choose File | Save to save the edited .XLS file. (Or use Save As and keep .XLS).
10. Now choose File | Save As. Change the "Save as Type" pulldown to "DBF 4 (dBASE IV) (*.dbf)".
11. Click Yes to the warning about keeping this format despite incompatible features.
12. Now click the upper right X square to CLOSE the file and close Excel.
13. Click Yes to the warning "Do you want to save the changes...".
14. Save it AGAIN to the .dbf (should be the default shown).
15. Click Yes at the warning to replace the existing file.
16. Click Yes at the warning about keeping this format despite incompatible features.
17. Now, at last, you should have a "GIS-safe" .dbf file.

NOTE: For future reference, GIS cannot accept any “formula” cells in .dbf files. If you ever have any in a file, first Convert to Values in Excel, then save the .dbf file.

C. Bring the Risk Table into ArcGIS 8.x using ArcMap.

NOTE: It is fastest and safest to put all files you will use in a GIS project *on your hard drive*, not a network.

1. **Start ArcMap** from Start | Programs | ArcGIS, with a blank map.
2. **Establish the Map Projection**: If you have a reference shape file layer, such as a county boundary or streets layer, available *in the same Projection and Datum as your HARP data*, you can add this to your ArcMap map document first. Do not add a layer that is in any other Projection/Datum.

   NOTE: Add only a layer that is in the **same projection as your HARP data**, which by default is UTM, NAD83 and in the correct UTM zone – either UTM zone 10 for northern and western California, or UTM zone 11 for southern and eastern California. (If you wish to switch to a different projection later, this can be done in a later step, and is described in step 4. below.)

3. **Open the HARP risk data table.** Now you are ready to add your HARP risk results data. Open your table using the appropriate Option below.

   OPTION 1: If you used a **Microsoft Access** format in section B, do the following.

   (a) Use the Tools | Add XY Data menu option.

   (b) Browse to the .mdb and then to the table you created in it.

   [NOTE: You may need to use the "Connect to Folder" icon to be able to see your data folder, if you have never connected to that folder with ArcMap before.]

   (c) Set the X Field to the UTME, and the Y Field to the UTMN and click OK

   (d) An "Events" layer is added to your map. (If the check box is not checked, turn it on to see the layer on the map.)

   OPTION 2: If you used a .dbf format in section B, do the following.

   (a) Use the Tools | Add XY Data menu option.

   (b) Browse to the .dbf file you created.

   [NOTE: You may need to use the "Connect to Folder" icon to be able to see your data folder, if you have never connected to that folder with ArcMap before.

   (c) Set the X Field to the UTME, and the Y Field to the UTMN and click OK.

   (d) An "Events" layer is added to your map. (If the check box is not checked, turn it on to see the layer on the map.)

   INFORMATIONAL NOTES:

   NOTE: For GIS, you should always know the Projection and Datum of your data. HARP v.17 and later produces output that, by default, is in the UTM Projection, with a Datum of NAD83 (North American Datum 1983). UTM zone 10 covers the northern and western part of California; UTM zone 11 covers the southern and eastern part.

NOTE: For GIS maps, UTM coordinates must be expressed in meters (not kilometers). HARP outputs in meters. (But if you ever use direct CEIDARS data, it would be in kilometers and needs to be converted to meters.)

NOTE: The View | Data Frame Properties, under the Coordinate System tab should have either no projection set ("Unknown") if you have no reference layer, or "UTM zone 10" or "UTM zone 11" (whichever is appropriate for your data), if you brought in a UTM-based reference layer.

4. Export the X,Y Points to a Shape File, To Allow You To Do Analysis and To Switch to Different Projections.

The "Events" layer of raw X,Y points is not yet a true GIS shapefile. Because of that, ArcMap would be unable to re-project it to a new coordinate system on-the-fly. If you need to re-project the data to something other than UTM, you should convert the "Events" layer to a shapefile. To do so, simply Right click the "Events" layer name in the list of map layers, choose "Data" then "Export Data". Choose the options to export "All features" and the button for "Use the same coordinate system as the data frame". Use the browse dialog to select a folder and give it a filename of your choosing. You can either create a stand-alone shapefile (using the .shp file extension) or save it as a personal geodatabase layer within your Access .mdb database if you have been using Access. When prompted, add the layer to the map. Now you have a true GIS-aware layer, with the known UTM projection of the map's data frame. (For example, if you looked at the shapefile files with File Explorer or My Computer, you would see this shapefile has .prj file, which is the definition file for the projection in which the data are stored).

At this point, you could change the map's data frame projection, and your new layer will be re-projected on-the-fly as well. ArcMap will reproject your map and any shapefiles in it (but not "Events" like the raw X,Y points) into the new map coordinate system. (However, see the exception below regarding datums.) You can again use the export method to save the shapefile: Right click, use Data, Export Data, and save using "Use the same coordinate system as the data frame" to save a new copy of the shapefile in your new map projection, if desired.

NOTE: This method in ArcMap cannot be used to switch between **datums**, e.g., from NAD27 to NAD83. ArcMap cannot convert datums correctly using the "on-the-fly" method. If you need to convert to a different datum than HARP uses (which is NAD83), then you must use the "ArcToolbox" to do the datum conversion, e.g., using the NADCON conversion method. Contact ARB for additional instructions if you need assistance with this ArcToolbox approach for datum conversion.

NOTE: You can import a desired coordinate system from an existing shapefile (or personal geodatabase layer) on your hard drive. Click **View | Data Frame Properties | Coordinate System**. Click on the **Import** button on the right side of the screen. Browse to a shape file that has the coordinate system you wish to apply to the map you are working on. Click **Add**.

Click OK. ArcMap will re-project your map and any shapefiles in it (but not "Events" like the raw X,Y points) using the new coordinate system.

5. **Symbolize the Receptor Points on the Map**: You should see each Receptor location appear as a point on the map. The left pane of the map window (Table of Contents) should show a new entry for the Risk points layer.

-- If you use the "Identify" tool on any one of the points on the map pane on the right, you should see the corresponding risk values at the point.

-- To do a quick symbolization that produces larger size dots for larger risk values:

(a) Right Click the risk layer name in the Table of Contents layer list and choose **Properties**.

(b) Choose the **Symbology** tab.

(c) Click to expand the **Quantities** tree entry. Choose **Proportional Symbols.**

(d) Set the **Value** field to the CancerRisk field (or whatever you named that column in your spreadsheet/mdb).

(e) If you don't like the default color, double click the small "Minimum Value" button with the small colored dot.

(f) Click ok.

(g) You should see different sized dots on the map depending on the risk.

NOTE: To see a sample of a map of the HARP demo data in ArcGIS using proportional symbology, click on the image file **HARPProportnlSymbls.jpg** included with this attachment .

NOTE: The Spatial Analyst Extension software is required for the following steps.

D. Using the Spatial Analyst Extension to Interpolate Surface and Compute Contour Lines.

1. **License:** Be sure you have a license available for the Spatial Analyst Extension. To do this, Start | Programs | ArcGIS | Desktop Administrator | Availability. You should see Spatial Analyst.
2. **Turn on the Extension:** Now turn it on in ArcMap, using the Tools | Extensions menu, and click the checkbox for the Spatial Analyst extension.
3. **View Toolbar:** You must also turn on the toolbar for Spatial Analyst. To do this, from the ArcMap map window, pulldown View | Toolbars and turn on the Spatial Analyst toolbar.
4. **Analysis Mask:** If you want the spatial analyst data cut to match the boundaries of another shape file, use the analysis mask. For example, if you are working with San Diego County and you don't want the analysis layer to go beyond the county boundaries, use the county layer as a cookie cutter.

a. From the Spatial Analyst menu pull down on the main map window, choose **Options**.

b. Next to **Analysis Mask** browse to the layer you wish to use as the mask (i.e. San Diego County). This shape file layer must already be loaded into your ArcMap document (step C2). Keep other defaults.

c. Click on the **Extent** tab at the top of the Options window. How far out do you want the new layer to go? If you want the new layer to go out to the edges of the existing layer then click on the drop down arrow next to **Analysis extent** and browse to the existing layer (i.e. San Diego County).

d. Click on the **Cell Size** tab at the top of the Options window. Keep the defaults.

e. Click OK.

5. **Interpolate the surface:** Be sure you have the risk layer selected in the table of contents. From the Spatial Analyst menu pull down on the main map window, choose **Interpolate to Raster**.

6. There are several options that could be used. I suggest starting with **Inverse Distance Weighting. (IDW)** You can also try Simple Kriging.

7. Set the Z value to the field CancerRisk. The other defaults are probably fine. I suggest you save it to a file using the browse dialog (bottom of the window) instead of just a temporary file. Turn on the new layer to see the colored surface.

8. **Contour lines**: Highlight/select the surface grid layer in the table of contents. From the Spatial Analyst menu pull down, choose Surface Analysis | Contour.

9. You may have to experiment to get contours you like. I suggest you try deleting one "zero" from the default. Click OK.

10. Save the output file.

11. You should see the risk contours. These should look similar (but not necessarily identical) to those generated by HARP when you ran the contour option in HARP.

NOTE: To see a sample of a map of the HARP demo data in ArcGIS using the Interpolate, IDW, and contours, click on the image file **HARPSpatAnContours.jpg** included with this attachment

E. Special Considerations.

NOTE: The above steps are designed to map one type of risk (e.g. 70-year resident, cancer) at all receptors. The steps assumed the risk was the total risk from all sources combined. You can choose to run the risk analysis in HARP that is By Source or By Chemical. The export .CSV file formats will be more complex, and you will probably have to split the file into several components to import each separately.

NOTE: HARP can run the PMI report to provide the "Top 100" (or however many you specify) receptors. This is also an option for export and import into GIS.